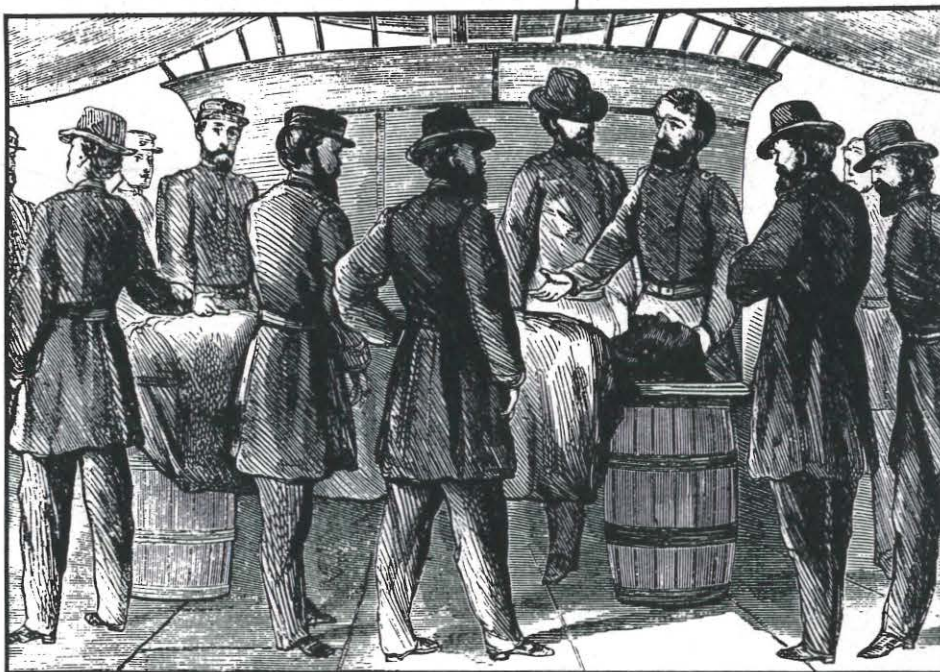
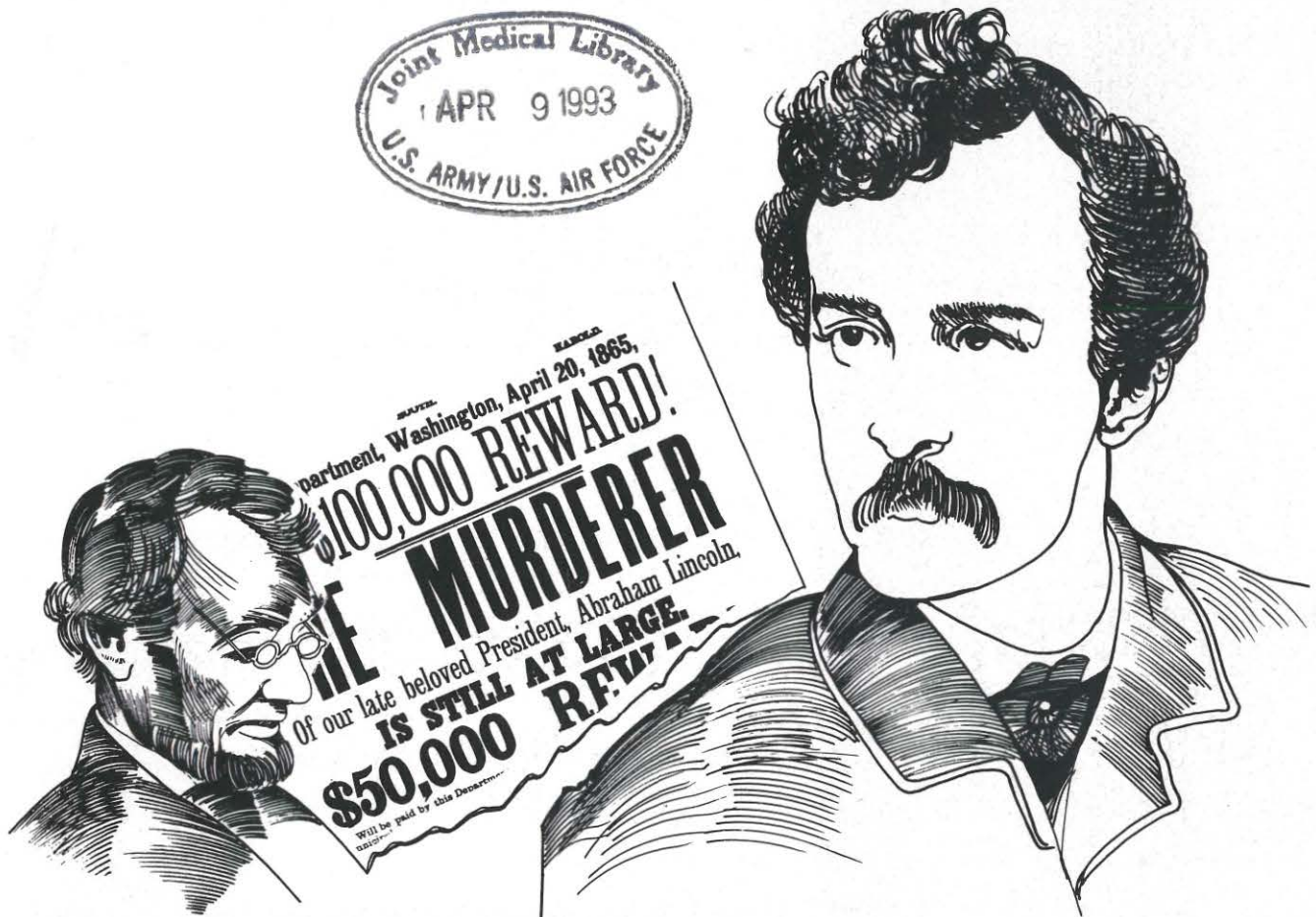


NAVY MEDICINE

January-February 1993



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COVER: Almost 128 years ago a body alleged to be that of Abraham Lincoln's assassin was brought aboard the ironclad USS *Montauk* for identification and autopsy. For a reexamination of those proceedings, see page 17. Cover art by Moses Jackson, NSHS, Bethesda, MD.

Fisher House:

A Port in a Storm

Karen Stansbury

That morning, enticed by the usual breakfast sounds and aromas, Madeline made her way on all fours across the warm and comfy carpeting lining the long hallway to the kitchen. Her eyes were fixed on the light streaming from the kitchen doorway. Happy images came to mind of what had routinely become the morning rush hour directed by 12-year-old sister Nadine and disrupted by 11-year-old brother Nolan. Somewhere in all that joyful, childish confusion, 9-month-old Madeline managed to be fed and even hugged a few million times.

As in a vignette from a movie, families like Madeline's play out a brief sketch of their destiny at Fisher House. Visiting very sick, hospitalized, loved ones, they find pieces of normal life and emotional refuge in the embracing beauty and warmth of the House. The Zachary and Elizabeth Fisher House on the grounds of the National Naval Medical Center (NNMC), Bethesda, MD, was conceived and built to enable families to be close to critically ill relatives. Since President and Mrs. Bush dedicated it on 24 June 1991, over 250 families have found comfort within its walls. Twice blessed, substantially many more will be helped when the second Fisher House is completed nearby this year.

Newcomers often arrive shocked by the blended experience of a tragic

diagnosis, a rapid move into unfamiliar surroundings, and leaving behind family and job. Their routine, as they knew it yesterday, vanishes as their lives abruptly take on a new and unwelcome focus.

Yet a transformation begins when they enter the front door of the colonial style, two-story beige-brick mansion. It is as if an invisible spirit greets them and, head-to-toe, they begin to relax and renew their energy.

"Since my brother became sick, I never would have believed that I could feel better," expressed Dave at a family Fisher House dinner. "But here, relief came quickly. People said that Dan would be given world-class care by the Navy and that certainly came to pass. But early on, our family felt jolted like being struck by lightning. Everything was uncertain and we were scared. Walking in the front door brightened the whole picture."

Helping hands from veteran families help newcomers adjust. Even the smallest gesture like sharing a cup of coffee helps. Joining forces, they serve as each other's absent extended family and make special efforts to create cheer and optimism. Superficial barriers such as language or age differences simply do not exist at Fisher House.

Under One Roof

With seven families under one roof, spunk and spirit are definitely part of House life. So are love and laughter,

friendship and birthday parties, and the excitement of living in a brand new mansion.

For weeks, the House buzzed with the dynamics of Madeline's family. Mom, an independent young woman with a strong sense of direction, pulled life together for the family quickly and singlehandedly. After "packing out" of Hawaii, she and the kids drove cross-country to their waiting suite at Fisher House. By the second day, Nadine and Nolan were enrolled in a neighborhood school and bus pickup arranged. By 8 a.m. on the third day, all three kids were dressed, fed, and ready for their new routine. The following day, Nadine was enrolled in Girl Scouts. While her older siblings were at school, Madeline and her mother kept vigil at Dad's bedside during his cancer treatment. Later, they joined Nadine and Nolan at the House for dinner and homework.

And so their days went—as close to reality as Mom could construct under such challenging circumstances. Zachary and Elizabeth Fisher, the benefactors of the House, even had the opportunity to meet this family. In the area for an official event, they popped in one Saturday evening. Nolan excitedly and proudly guided them on a tour which included his family suite where *real* home life was on display, including baby bottles, stacks of clean laundry, and even a science project lining the bathroom counter!



**Residents of
Fisher House**

Binding Friendships

The bonds that form among Fisher House families are strong enough to last a lifetime. Brian, a young man with terminal brain cancer, found the dad he never had with Amman, another cancer patient. They and their families shared long days at the hospital, life-threatening surgeries, arduous recoveries, and all the related emotions. During rare, brief "well" periods when they were allowed to leave the hospital, they eagerly planned and provided wonderfully creative and high-spirited dinners for everyone at the House.

Ann, a mid-Westerner, far from her family of eight grown children, kept vigil at the side of her only sister for weeks. At times, Ann was simply unable to bear the stress of helplessly watching and waiting for a turning point. Fisher House friends showed her how she was actually helping a great deal. After all, she consulted with doctors and nurses daily. She updated family and friends. She conducted her sister's personal affairs. Most importantly, while her sister lay in a drug-induced sleep, Ann thoughtfully



deliberated the second devastating surgery. Amputation of both legs was required as the last life-saving effort. Had it succeeded, Ann would have been a vital link to her sister's understanding and acceptance of such a drastic measure.

The end was inevitable for Madeline's dad. Never for a moment was it easy, but tender hugs and gestures from hospital staff and Fisher House friends helped cushion the impact.

There was a shared last dinner. And, a beautiful "piping ashore" ceremony was held in the living room. The children were helped to use the office word processor to write Dad a final goodbye.

From the Inside Looking Out

Naturally, the most common impression outsiders have of Fisher House is of an environment full of sorrow. The question most frequently



Photo by the Editor

Zachary and Elizabeth Fisher House

Colonial style, two-story beige-brick mansion with single-story side wings. Doric columns frame double front doors which open onto an ante-foyer and grand foyer where a beautiful chandelier suspends over the reception area. Ceilings are 10 feet on the first floor.

Opening onto the foyer are the living and dining rooms. Elegance is suggested with floor to ceiling windows and bookshelves; but, the fireplace, a Williamsburg-blue

color scheme, and comfortable furniture give the living room a relaxed, homelike feel. Period furnishings and floral wallpaper in the dining room extend a welcome to all visitors.

The kitchen, with its emphasis on light reflective white trim, tile floor, appliances, and floral wallpaper offers a cheery atmosphere to residents, and is everyone's favorite room. A private kitchen cabinet for each room is housed in a center

island which also serves as a communication "hub."

The wings are two-room suites where up to six persons may sleep. French doors open onto small patios. An office and powder room complete the first story. Five bedrooms on the second story can sleep up to 10. All bedrooms and suites have private baths.

Fisher House conveys an unmistakable aura of elegance, strength, and comfort.

asked is, "How can you take all that stress all the time?" The truth is, I feel it is a privilege to be close to these families during this special time in their lives. Early on, the best approach was clear. Think of each person as a good friend or member of my own family. That way, listening and reacting would come naturally.

Listening is the core of relationships here. They need to get it out. Their stories are gripping. Along with them, I also frequently feel full of pins and needles waiting for a turning point. Mostly, I marvel at their choice to view things optimistically, sometimes even humorously. J.D., a young marine, had me in stitches one day as he described, with hilarious sound effects, the entire ordeal of his brain biopsy. Not a fun procedure, it starts with screwing head gear into the four corners of the skull. J.D. underwent it twice!

An empty room never waits long for a new family and the House frequently bulges at the seams with 100 percent or more occupancy. A family can consist of one person or several. The "singles" may share their rooms, enabling more families to be helped. Some families stay only a few nights. Others use the maximum allowed stay of 30 days. The House best serves the longer-term families.

Getting in starts with a referral form which filters through an admissions team headed by NNMC's Associate Director for Patient Administration. Selections are limited to high priority cases such as inpatients with life-threatening injuries and illnesses, cancer being the most common. Low income and distance traveled are also considered.

Navywide teamwork and compassion are the keys to success. Recognizing its contribution to patient care, the Commander and staffs at NNMC as well as the Bureau of Medicine and Surgery and associated organizations enthusiastically offer support. Each takes its important role very seriously. As manager, I only facilitate and focus the efforts of others. The cooperative spirit that prevails makes my job easy.

A good example can be found by looking back. Getting ready to open the House for the first families was intense, exciting and upbeat, mind you, but nonetheless intense. A lot of work had to be compressed into a short time.

My first day on the job I sensed rising panic (my own) when people welcomed me warmly, quickly sighed relief, and said, "Boy, we're sure glad you're finally here."

After a few days of wondering if miracles were expected, I finally had the bright idea to ask when we were scheduled to open for the first families. "How about a week from this Friday?" was the answer. "That's when the President is available for the dedication." I recalled thinking that a panic attack would not work and would leave a bad first impression. "Besides," I thought, "the entire United States Navy is behind this. Use it!"

What unfolded was the most amazing combined effort I had ever witnessed. Each and every individual called upon for help played his or her position beautifully, responding instantly with a broad smile and sparkling eyes, as though just waiting eagerly to be asked. At the end of every day, I wondered if such a positive atmosphere was the norm around here, or was the Fisher House simply top priority? I have since come to understand that the norm is indeed positive and that all patient and family caring efforts are top priorities. My work and my co-workers exhilarated me then and still do.

Taking Care of Our Own

The most significant effect on me has been the Navy-Marine "We take care of our own" spirit. An overwhelming outpouring of love has been felt here, almost as though the House has filled an abiding human need to help others. Mr. and Mrs. Fisher started a contagious spirit of giving. Individuals and organizations call often to volunteer or make much needed donations. The House alone does not help and heal. A much brighter light shines, giving families faith

every step of the way. Mr. Fisher likes the expression, "Sailors or marines should never have to look over their shoulders to seek support for their families. They can rest assured that it is ready when they need it."

The broader Navy community also responded with financial support. For the most part, donations keep the House going, accounting for 50 percent of the first year's expenses. NNMC contributed 30 percent, and 20 percent came from the nominal room fees collected.

Several avenues for donating to Fisher House have already been set up. Memorial funds and other cash gifts can be accepted directly by Fisher House. Payroll deductions are possible through the Combined Federal Campaign (CFC), or contributions can be made to the Navy-Marine Corps Relief Society expressly for Fisher House.

Navywide, families are also helped at two other locations. The San Diego Fisher House opened in June 1992. Another, although not owned by the Navy, serves the Portsmouth Naval Hospital. To learn how to refer families or make donations to any of the Houses, please call their managers:

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Karen Stansbury is manager of the Zachary and Elizabeth Fisher House, NNMC, Bethesda, MD 20814-5002



The Man Behind Fisher House

Zachary Fisher's Park Avenue office sits atop a towering office building in midtown Manhattan. Outside is a breathtaking panorama of the East River and New York City's legendary skyline. Inside and up close, mementoes, airplane models, and autographed photos adorn the walls and every surface of his massive desk. And they all reflect the man's love affair with the Navy and with the nation his father adopted as an immigrant near the turn of the century.

A firm handshake and warm, welcoming smile is my introduction to Zachary Fisher, a man recognized as one of America's most dedicated patriots and generous philanthropists. Born in Brooklyn in 1910, Fisher has spent his life in New York, beginning his career at age 16 when he left high school to join the family's fledgling construction business. "Through hard

years, hard work, and integrity," Fisher Brothers became one of the most successful builders of apartment houses and commercial office buildings in the New York metropolitan area.

When the United States entered World War II in 1941, Fisher was ineligible for military service due to a serious knee injury incurred in a construction accident. Nevertheless, determined to do his part, he aided the Army Corps of Engineers in building coastal forts.

Years later, having made his fortune, Zachary Fisher saw an opportunity to express his appreciation to the country that gave him and his family opportunities only American citizens could enjoy.

Veterans, the military services, and particularly the Navy have felt Fisher's limitless generosity. Through his

efforts, USS Intrepid, the much decorated aircraft carrier of World War II, was saved from the scrap heap and transformed into the Intrepid Sea-Air-Space Museum permanently moored on Manhattan's west side. When a terrorist bomb took its awful toll of American servicemen at the Marine Corps barracks in Beirut, and Iraqi missiles killed other U.S. sailors on USS Stark, Fisher recognized those sacrifices by assisting the families of the victims. His Zachary and Elizabeth Fisher Armed Services Foundation subsequently aided the families of the battleship Iowa tragedy. The foundation continues to provide scholarships to men and women who have served in the Armed Forces and to children of servicemembers.

But if the Intrepid seems to be Fisher's pride and joy, mention Fisher House and his eyes really light up.



Photos by the Editor

Since 1990, when the first Zachary and Elizabeth Fisher House opened at the National Naval Medical Center in Bethesda, MD, the ordeals of dozens of families of critically ill patients have been eased by what these houses offer—an opportunity to be close to those relatives in a family atmosphere of love and mutual support.

Navy Medicine: I understand your father was born in the same town in Russia where Irving Berlin came from.

Zachary Fisher: Yes, that's right. My father came here about 1900 and became a small bricklaying contractor doing jobs for other builders. I quit school at age 16 and went in with my two brothers and Dad, making it a family business. That was over 67 years ago.

You now call your philanthropic work a partnership between you and Mrs. Fisher. I understand she was a USO performer in World War II.

Elizabeth was an actress. When I met her, she was in a stage play with Elizabeth Bergman and an actor whose name I can't remember. That was about 50 years ago.

Is she a New Yorker also?

Elizabeth was from Pennsylvania. We were married and then she went overseas and played for the troops in Italy. One of the important things she did was to visit hospitals and comfort the wounded. When she got back, I became vitally interested in the Veterans Bedside Network. That was my first initiation to the military services.

What is that organization about?

The Veterans Bedside Network was started by an actress. It's an interesting concept. She conceived an idea which really caught on. Hospitalized veterans get the opportunity to write scripts for shows and then direct and act in them. They tape the performances and then play them back. It's quite a great

tonic for these guys who are the forgotten people. The organization is active in Veterans Hospitals all over the country, and Elizabeth and I are still very active.

When did your affiliation with the Navy begin?

It was in 1978. The editor of *Vogue* magazine invited me and a group of other prominent people to a breakfast meeting. They showed a tape about the *Intrepid* narrated by Cliff Robertson. It was an unbelievable story. *Intrepid* has a history like no other ship in the Second World War. It lost more men to Kamikazes than any other ship. Its planes also sank the biggest ships the Japanese had. She was hit so many times but she always came back.

I remember going home and telling Mrs. Fisher about the meeting and the *Intrepid*, and that the ship was scheduled to be scrapped. The very next morning I made up my mind to do something about it. It took me 5 years



Opposite page: Moored at a pier on the Hudson River, the Intrepid Sea-Air-Space Museum is a principal tourist attraction to Manhattan's west side. **Left:** The flight deck of USS *Intrepid* seems an incongruous resting place for a retired A-12 "Blackbird" spy plane.

from then to get that ship saved as a museum.

It was at that first meeting you heard the ship would be scrapped?

Yes, the first time. I didn't know anything about the ship or the Navy. Until then I was a businessman. It just never would have occurred to me to do anything about the Navy. The *Intrepid* project really started it all.

What's it like to have your own aircraft carrier?

I'm the only private owner of a museum of that sort in the world. Aircraft carriers or submarines or destroyers were never given to a private party, but usually to a state or a city because no one else could afford it.

You have done other things for the Navy as well. What about your response to the bombing of the Marine barracks in Beirut?

I remember wondering what would happen to the children of these men who were killed in action. So, we started a fund for their college tuition. Not only my money but that of a lot of other people.

Did you set up a foundation at that time for the Beirut family members?

No, not at that time. I'd go to differ-

ent clubs all over, ask for funds, and tell them that whatever they would give I'd match it.

The Marine Scholarship Foundation was able to administer the monies. In fact, a year ago I learned that the first youngsters that benefited from those scholarships had just graduated from college. That was quite a thrill. We have already sent 750 Marine dependents to college.

We have since set up a foundation—the Zachary and Elizabeth Fisher Armed Forces Foundation—for helping servicemen and women and their families in their time of need. We're now sending 107 youngsters to college. Our foundation takes in every service the Marine Scholarship Foundation doesn't, including Army, Navy, Air Force, and Coast Guard.

What about the Iowa incident?

The *Iowa* was a tragic thing. I know you can't replace the loss of a young son, but I thought it could help the families to know that somebody out there was also feeling this great tragedy. Each family got a check for \$25,000.

How did your idea for the Fisher Houses come about?

It was really the idea of Mrs. Trost, the wife of the then Chief of Naval

Operations (ADM Carlisle A.H. Trost). She recognized the need for this kind of facility and it fit right in with my Armed Forces Foundation. Being a builder, I immediately took it on. In fact, we'll have 10 houses finished this year and 22 by the end of 1993 which will house 3,000 immediate families. With children, that translates to between 8 and 10 thousand people a year.

The House at Bethesda is the first and is the prototype for all the others. Are the other Houses similar in design?

They're all exactly the same. I want to bring out that these Fisher Houses still have to be maintained and furnished. Their expenses run almost a \$100,000 a year. So, any funds that come in from the military and all over the world are appreciated.

I understand you will shortly be opening some new Fisher Houses.

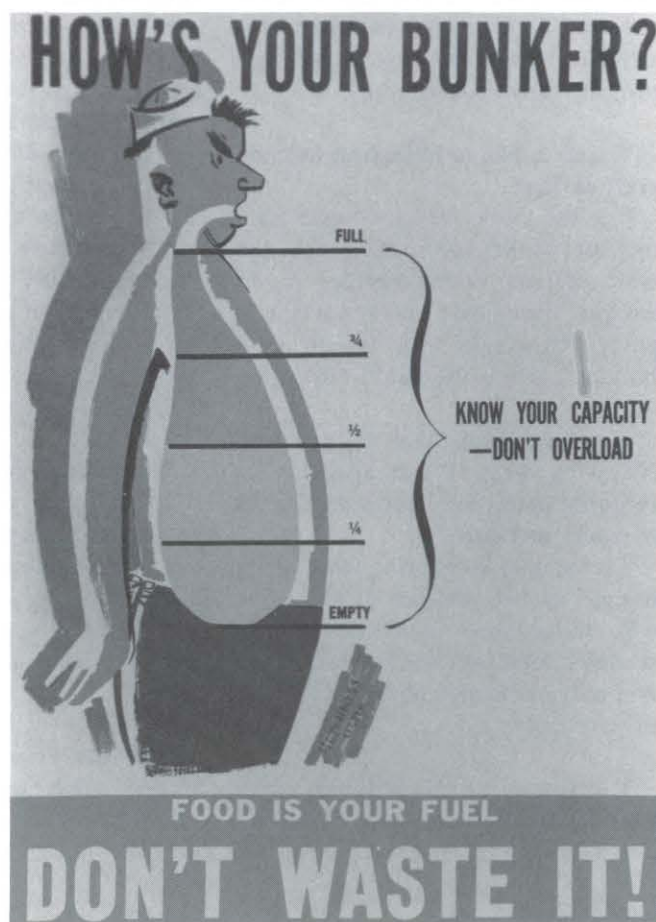
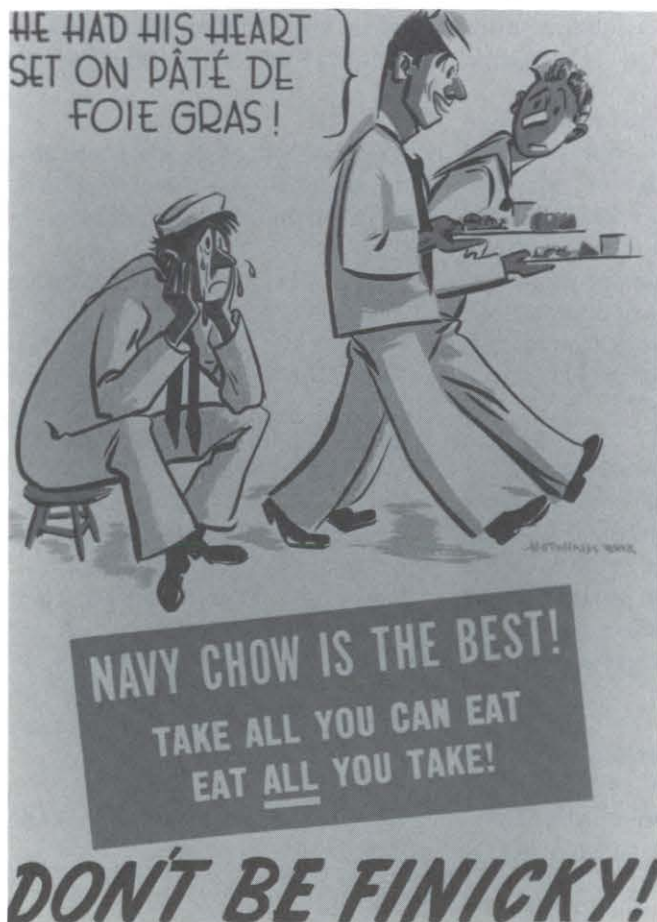
That's right. Mrs. Fisher and I will be having our 49th anniversary and opening two houses in San Antonio on my birthday. You usually get a gift on your birthday. I'm always giving away a Fisher House on mine.

What a wonderful tradition that is!
—JKH

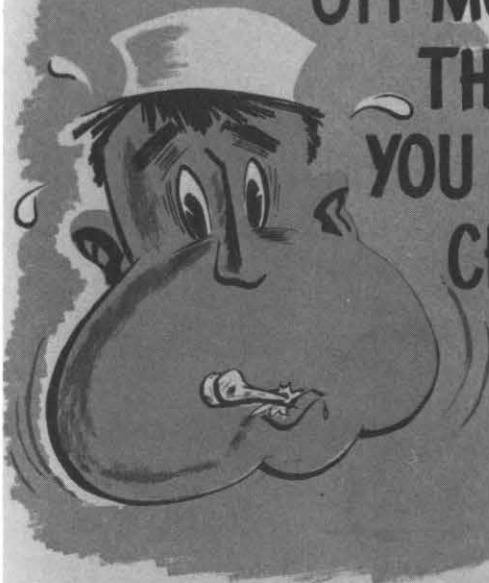


Food is Ammunition— Don't Waste It

As citizens on the homefront during World War II were exhorted to plant victory gardens and cooperate with rationing to ensure adequate food for the fighting forces, sailors were getting the not so subtle message to make every mouthful count. These posters were recently discovered in the BUMED Archives. One of the artists, Hank Ketchum, is better known as the creator of Dennis the Menace.



**DON'T BITE
OFF MORE
THAN
YOU CAN
CHEW!**



take ONLY what you can eat!

**YOU WOULDN'T DEPRIVE
YOUR FAMILY OF FOOD!**



OF COURSE NOT!

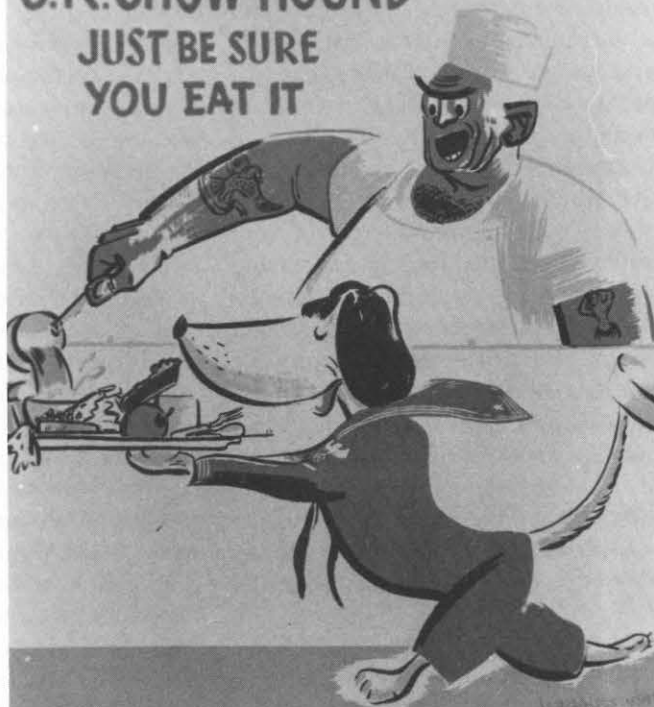
**BUT—THAT'S EXACTLY WHAT YOU DO
WHEN YOU THROW GOOD CHOW AWAY!**

**WHEN YOU TAKE MORE
THAN YOU CAN EAT
YOU CHEAT YOUR BUDDIES
IN THE FLEET!**



DON'T WASTE GOOD FOOD!

**O.K. CHOW HOUND—
JUST BE SURE
YOU EAT IT**



WATCH YOUR WASTE!

War at Sea:

Unique Challenges for Navy Medicine

CAPT Arthur M. Smith, MC, USNR

Within the operational setting, medical services are often provided under conditions which differ significantly from those in fixed health care facilities during peacetime. It is, for example, self-evident that operations at sea contain many health hazards for deployed Navy personnel. Many of these dangerous conditions are unique to the maritime environment. When combat is introduced into this intrinsically precarious setting, the delivery of health care can be heavily compromised and occasionally impossible to accomplish. From the naval perspective, whether afloat upon the high seas or deep below the ocean's surface, very different medical issues emanate from these diverse operational settings. Navy health care personnel remain obligated to prepare themselves for fulfilling their mission under these unusual and often challenging conditions.

Enclosed Spaces

Inherent to the Navy's operating environment is the reality that many personnel perform their duties while enclosed within confined spaces. Aside from military aircraft, such enclosed spaces are found on submarines and in armored gun turrets aboard surface ships.

Even prior to Archimedes' description of the principles of submersion, Alexander the Great is alleged to have used a submersible vessel at the siege of Tyre in 332 B.C. Subsequently, submarines were developed, and inventors attempted to power them by hand, by steam, and later by electric batteries and petroleum-fueled engines. A submersible vessel was even deployed unsuccessfully by the Americans against the British in the Revolutionary War. In the American Civil War, a Confederate vessel, the *H.L. Hunley*, became the first submarine to actually sink a warship, but this was hardly a victory since the *Hunley* and her crew also went down in the explosion.

By 1900, several innovations evolved in development of the 20th century submarine. These included a strong metal hull that could withstand great pressure, a self-propelled torpedo that could be launched by the submarine, a gasoline engine for power on the surface, and an electric propulsion system that did not require contact with the atmosphere.

Within surface ships, significant improvements occurred in the mid-19th century, and many innovations appeared in the military hardware of the American Civil War. These included iron-clad ships, large powerful naval guns, and revolving armored

gun turrets. By World War I, improvements in surface ships continued, and combatants were engaging each other in very large, massively armored and heavily armed battleships or dreadnoughts.

Improvements in weapons design and their delivery systems did not arrive without creating new hazards for military personnel, wherein the man-machine interface and performance envelope challenged the capacity for human adaptation. Initially, undersea craft were required to surface frequently to recharge their batteries.

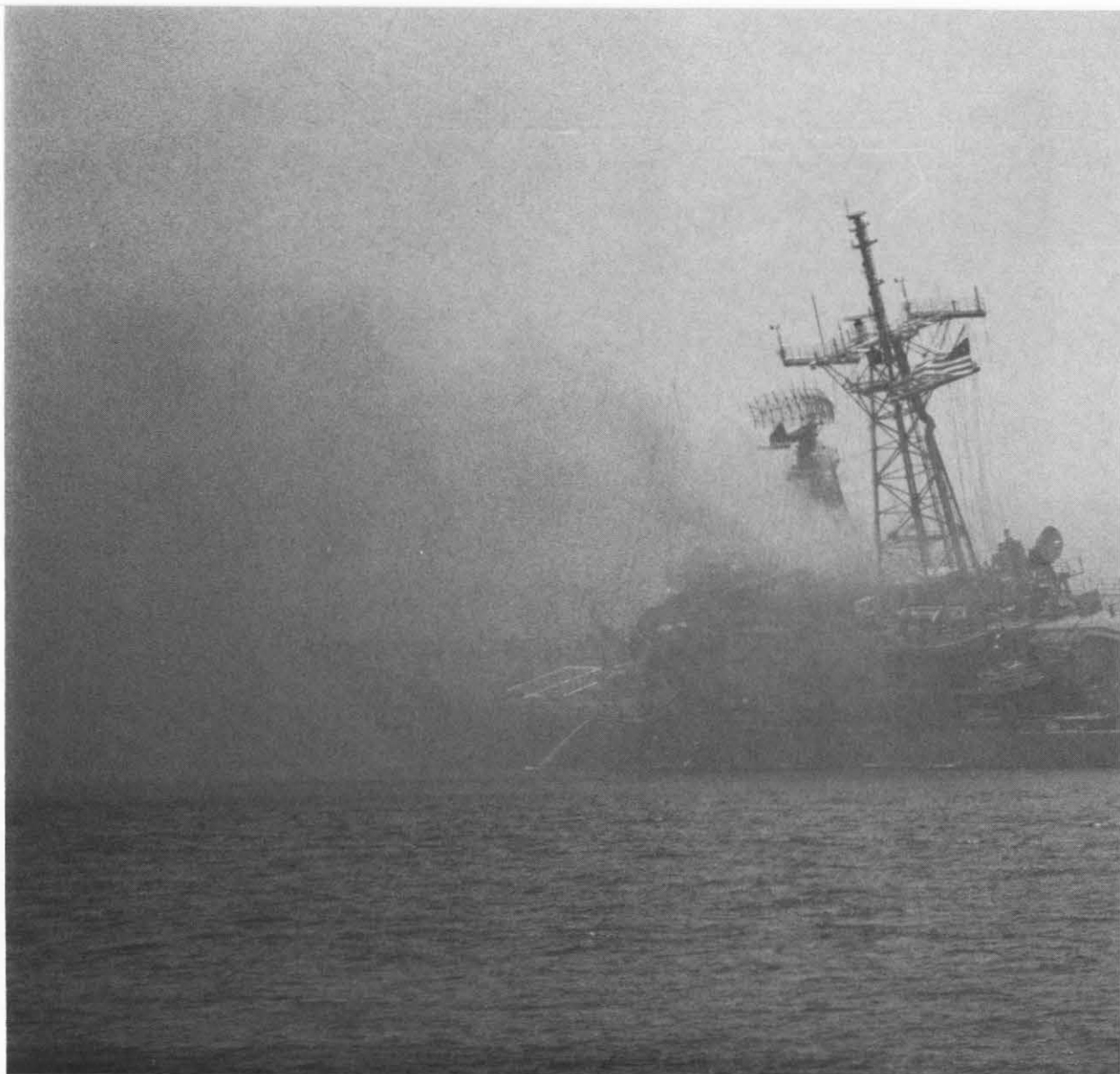
In the 1930's, Dutch naval experts developed the snorkel which allowed the craft to remain submerged for long periods (one German U-boat remained submerged for 69 days). When necessary, a fan pulled in fresh air and the diesel engines were run under the sea. The internal environment of the submarine before the nuclear age was unpleasant, however. Submariners described foul, stale air that reeked of diesel fuel and other unpleasant odors, and of mildew that covered food, clothes, and bunks.

In the U.S. Navy during World War II there were many reports of reduced effectiveness in submarine crews because of what the Navy called, "defective habitability." Examples of such World War II U.S. Navy reports



U.S. Navy photos

USS *Tripoli* (LPH-10) lies in dry dock awaiting repair following an encounter with an Iraqi mine during Operation Desert Storm.



were: "Battery compartment of torpedo flooded during attack, emitting chlorine gas into the boat"; "Lack of air conditioning decidedly had a debilitating effect on crew and slowed their reactions"; "Patrol somewhat handicapped by poisoning (carbon tetrachloride) which affected majority of crew over 10-day period" (carbon tetrachloride was used as a cleaning spray for electric motors—when the motors became hot it volatilized and produced phosgene); "Battle efficiency has been practically zero, especially at night."

The debut of the nuclear submarine in 1955 brought with it atmospheric control. Oxygen was extracted from sea water and air scrubbers removed contaminants, but the questions and problems with submarine air quality persisted. Furthermore, submarines

still carried many high energy batteries, and the charging process gives off hydrogen and oxygen. In this setting where the most common conflagrations emanate from electrical panel fires, they can be very difficult to extinguish. Additional fire risk from cigarettes, deep fat fryers, oxygen generators, the catalytic convertor for atmosphere control, and dryers in the vessel's laundry, are also very significant hazards. Even aboard some newly designed surface ships, the trend in ventilation design is also toward closed loop systems. This will make surface ships' fire and ventilation problems akin to those of the submarine, with greater concern over toxic gas dissemination.

The American Civil War also introduced the rapidly firing predecessor of

the machine gun. This innovation subsequently increased the exposure of gunners to toxic propellant combustion products manifold. During World War I, machine gunners sequestered within enclosed spaces and fearing gas attacks, attempted to use any materials available to create hermetically sealed air tight envelopes around themselves and the breeches of their machine guns. Containment of dense accumulations of carbon monoxide within their breathing spaces caused by incomplete combustion of propellant in the machine gun shells, thereby created additional serious hazards and many subsequent casualties.

Before World War I, the German Navy experienced problems with "nitrous fumes" filling the confined



A port quarter view of USS Stark (FFG-31) after it was hit by two Iraqi-launched Exocet missiles in 1987.

that evacuated the combustion products in the large gun tubes before the gun breech was opened. To this day, however, the presence of NO and NO₂ in such military enclosed spaces is still a matter of serious concern.

With the advent of new structural materials, fuels, and compartmentalization requirements in Navy ships, new fire scenarios have also emerged. In recent years, "advanced materials" (graphite composites, synthetic lubricants, artificial fibers and fabrics, adhesives, matrix systems, and advanced coatings) have played increasingly important roles in military designs. The ship-building industry turned to these materials for use in bulkheads, joiner doors, and even hull components and fittings. Unfortunately, many of them also possess significant thermal and flammability properties, as well as the propensity to form many toxic byproducts upon incineration. Furthermore, fire effect studies on the integrity of bulkheads separating ship compartments have demonstrated the easy propagation of these particulate byproducts of combustion, as well as smoke, through the various conduit systems and wire bundles which penetrate these barriers.

Ships Under Attack

Large numbers of casualties are rendered during war at sea. For example, aboard U.S. destroyers during World War II there were 6,895 men wounded, 400 more who died of their wounds, and 3,565 killed. Aboard battleships there were 1,684 wounded and 2,061 killed. The carriers also had their share of casualties, experiencing 2,600 wounded and 1,885 dead. (Following the bombing of a single carrier, USS *Franklin*, explosions and fires resulted in 1,000 casualties among the 3,300 crewmembers, 800 of whom died and were buried at sea.) Even in the submarine community, despite 4,500 MIA's, there were 1,178 surviving injured.

Related secondary explosions during maritime conflict can further magnify the generation of casualties. USS *Princeton* (CVL-23), for example, after being struck by an aerial bomb from a kamikaze, experienced significant blast and fire damage. Casualties included 7 deaths, 92 missing, and 191 wounded. Later that day, USS *Birmingham* (CL-62) came alongside to render aid in salvage. Shortly thereafter, an explosion from the aftersection of *Princeton*, which blew off her stern, swept *Birmingham* with blast, flame, and debris, killing or wounding half her personnel as well.

Just what are the additional hazardous events that occur when a missile, bomb, or artillery round penetrates a ship's physical integrity? These issues, and more, should obviously be of vital concern to medical personnel within the sea services.

A recent analysis of data describing surviving World War II Navy casualties showed that penetrating wounds and burns constituted over 60 percent of the battle wounds incurred within ships under attack. Following munitions explosions within the relatively confined spaces of ships, casualty data from naval warfare have generally confirmed a high frequency of multiple penetrating body wounds emanating from the release of large quantities of shrapnel. In addition, the fires resulting when fuel-laden kamikaze aircraft, bombs, and torpedoes were prominently utilized as weapons, and the need to fight these fires immediately, even in the face of continuing combat, have generally led to a high frequency of extensive burns, toxic gas inhalation, and asphyxiation among crewmembers. Modern missile warfare, as demonstrated by the experiences of the Royal Navy during the Falklands War, as well as our experiences aboard USS *Stark* (FFG-13) following its attack by the Iraqi air force, have demonstrated that similar

space within naval gun turrets when the gun breech was opened for reloading. The gunners were overcome by the irritant gas and, for protection, wore respirators. The gases causing the problem were probably a mixture of nitric oxide (NO) and nitrogen dioxide (NO₂). The protectant masks that were used, consistent with the practice of the day, probably contained soda-lime and activated coconut shell charcoal. While wearing the masks, the gunners were suspected of having developed methemoglobinemia from the NO, with deaths occurring. Evidently, the masks did not remove NO and may have actually increased the content of NO in inspired air through the reduction of NO₂. To counteract this, the Germans introduced a compressed air bore cleaner

problems are to be expected in the future.

Ballistics research has demonstrated that when the hull of a ship is penetrated by high explosive munitions or kinetic energy rounds, a spray of hot fragments emanates from the munitions and defeated metallic hull. These may well result in fragment injuries to crewmembers within the penetration path. Within this spray of fragments, known as a spall cone, a thermal pulse may also occur, which can ignite any nearby flammable material. These destructive phenomena are generally accompanied by "blast overpressure" within the adjacent crew space as well,

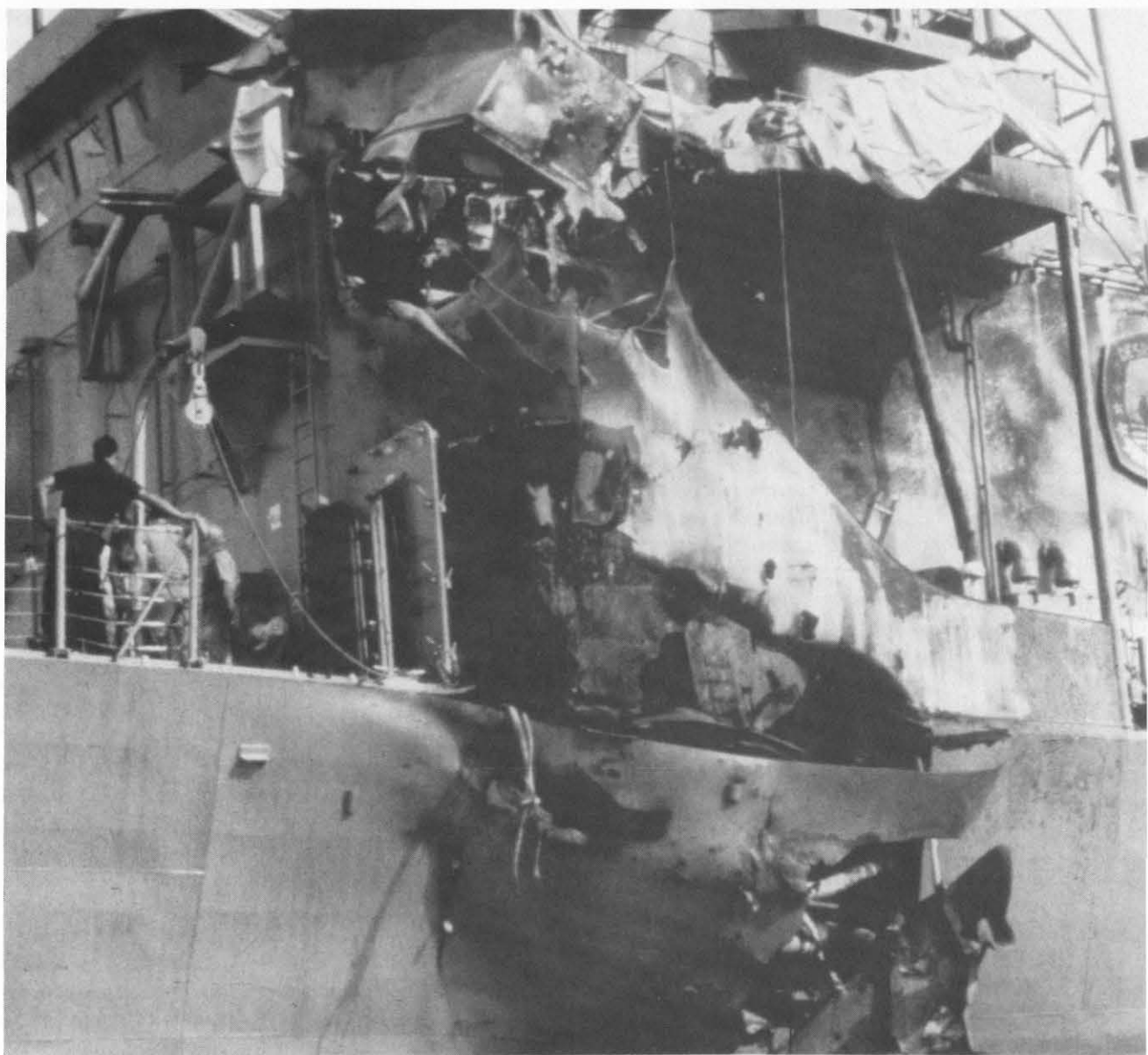
and a brief intense flash. The bodies of nearby crewmembers may also become accelerated by motion of the surrounding and collapsing physical structure, while toxic gases are generated by heat from burning materials or from the penetrator itself.

The term, "blast overpressure," describes the high pressure environment created by exploding munitions. The generation of the blast environment is an extremely complex phenomenon due to shock wave reverberations off of the many surfaces within the path of the penetrating warhead. Nevertheless, primary blast injury entails contusionlike injury to air-containing

structures of the body such as lungs, gastrointestinal tract, and ears, as well as their potential rupture.

Optical injury from the intense flash may include permanent retinal injury (scotomata), corneal photokeratitis (welders' flash), corneal surface burns, and temporary flashblindness (after-image).

In the face of a threatening thermal environment, there is a variability in the degree of human tissue damage, especially when personnel are protected by clothing. The first 10 seconds after hull penetration are considered the most critical period for burn injury. Unless it catches fire, any



clothing offers some protection in a brief thermal exposure. In a significant thermal environment, however, few current garments can resist ignition for longer than 10 seconds.

Following hull penetration, a shaped charge jet will combine atmospheric nitrogen and oxygen to form NO and NO₂. NO, as noted above, is known to induce methemoglobinemia. NO₂, highly soluble in water, is absorbed by the cells of the tracheobronchial tree and converted into nitric acid, obviously highly caustic to the lungs and respiratory passages. Burning propellant of the missile will also release NO and NO₂, as well as carbon

monoxide, another well known antagonist of hemoglobin oxygen transport. Burning plastics and insulation materials may also release hydrogen cyanide, vaporized hydrogen chloride, formaldehyde, and acrolein.

It is generally assumed that most personnel within an attacked vessel will undergo strenuous exercise within hours of toxic gas exposure. It has been shown that increased frequency and depth of tidal ventilation in this setting increases exposure to tracheobronchial inhalation injury. Through exposure of the most distal recesses of the tracheobronchial tree and alveolar membranes to vaporized caustic chemicals, greater degrees of airway and pulmonary alveolar damage will ensue. Notwithstanding the potential for upper airway burns from the direct effect of thermal injury, the additive effects of tracheobronchial and alveolar toxic injury, the influence of various inhaled agents upon the integrity of hemoglobin itself, as well as the effects of blast wave injury upon the lung parenchyma, the exposed individual will be predisposed to potentially significant hypoxemia.

Blunt body injury may also result to crewmen when force is delivered to a crewman's body by bulk action of a hull space impacted by an energetic penetrating missile, or if he is in contact with a surface violently deformed by the explosion of an adjacent mine. Injury may also occur after people have been thrown into structures or by having been struck by displaced objects. The entire spectrum of blunt injury may thus be superimposed as well.

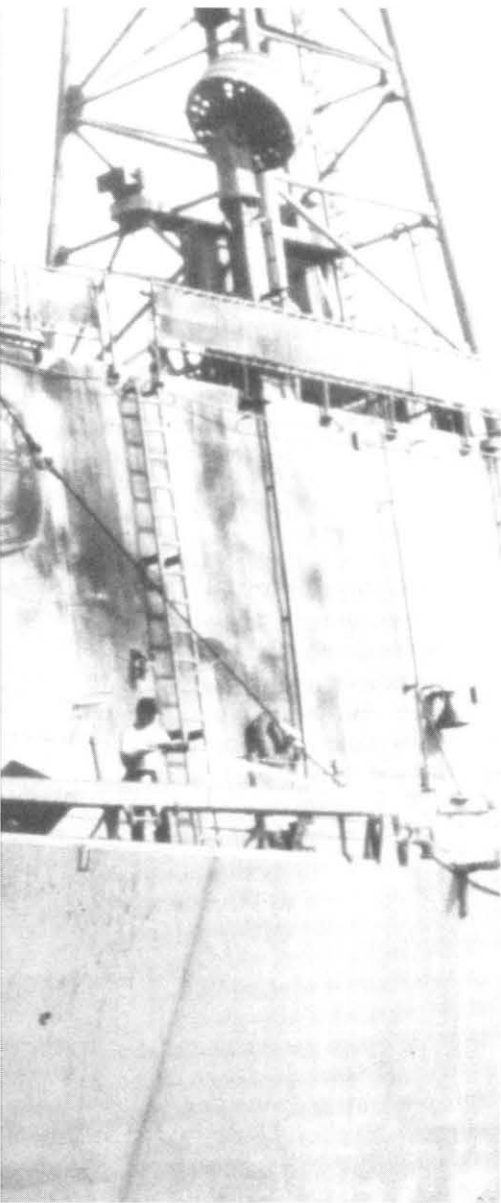
The implications of these physiologically debilitating events are underlined by the findings of causes of death aboard *Stark* following its attack by Exocet missiles. Of the 37 accrued fatalities, 13 were due to burns, 6 from smoke inhalation and asphyxia, and 17 from blast injury. When a missile penetrated HMS *Sheffield* during the

Falklands War, but failed to explode, the searing heat generated by its passage through the hull and into the forward engine room set fire to paint, PVC cable, and other flammable materials. Within 15 to 20 seconds, the ship was full of black, acrid smoke. Twenty men died from this hit, and an additional 24 were casualties, suffering from burns and smoke inhalation. The Argentine bombing of the British auxiliary ship *Sir Galahad* resulted in the sudden generation of 83 burn victims among a total of 179 casualties.

An additional reality of naval combat is that most ships are primarily designed to support war missions. During combat, therefore, the extraction and immediate treatment of casualties must be subordinated to both continuation of the fight and damage control efforts to save the ship. Delays in the immediate delivery of medical care are inherent in this process. For example, following a kamikaze hit upon the superstructure of the battleship *New Mexico* (BB-40), 30 sailors were killed instantly and 129 wounded. For the next 4 days *New Mexico* was under repeated air attack and all hands remained at general quarters. Medical personnel manned general quarters stations by day in order to provide first aid should there be additional casualties, and were only able to render definitive care to the previously wounded at night. **It was not possible to evacuate the wounded from *New Mexico* until 13 days later!**

Ship Abandonment

An Exocet missile penetrated the hull of a British warship during the Falklands War, generating searing flames, thick smoke, and mortally wounding the vessel's watertight integrity. Amidst the confusion associated with ship abandonment, survivors described the full horror of burning decks, cries of trapped victims, and a precipitant rush into the cold icy sea as the ship was abandoned. The formida-



Damage to USS *Stark*

ble task of evacuating casualties from a 50-foot-high deck, down the listing side of the ship into the life rafts below, was only accomplished with significant difficulty.

During World War II almost two-thirds of all fatalities at sea were lives lost during the ship abandonment-survival phase of naval combat operations. During the Falklands War, of the 71 life-raft survivors following the torpedo attack upon the Argentine cruiser *General Belgrano* by the British submarine HMS *Conqueror*, 69 suffered from hypothermia and 18 died from this condition. How many of the 300 or more deaths following this attack actually occurred during the survival phase following abandonment is not known, but it probably accounts for the majority. Following Argentine air attacks upon HMS *Coventry* and *Atlantic Conveyor*, when survivors were obliged to take to life rafts or to the water, two *Coventry* crewmembers drowned. Most of the 12 from *Atlantic Conveyor* who died were in the water as well, and no doubt experienced profound hypothermia. Even crewmembers in life rafts ultimately required treatment for hypothermia.

When USS *Morrison* (DD-590), a radar picket ship on duty off the coast of Okinawa during World War II, was hit by four kamikazes in 10 minutes, attempts to establish the main battle dressing station in a safe area of the ship were futile. One hospital corpsman had been killed and another was severely wounded. In the face of existing chaos and extensive wounding, each sailor had to render first aid whenever and wherever he could. Arresting bleeding was the sole objective of any aid rendered. The ship began to sink rapidly, and the survivors spent hours in the water. Among them were 90 injured, their wounds often masked by a heavy layer of fuel oil. The medical officer and remaining corpsman could only swim from group to group, offering encouragement and what little aid was possible under the extreme circumstances.

"Immersion blast exposure" is

another cause of injury and death among waterborne survivors. In October 1967, Egyptian missile boats attacked and sank the Israeli destroyer *Eilat* opposite Port Said, Egypt. While the surviving crewmembers struggled in the water, the Egyptians fired another missile that missed the destroyer and exploded in the water nearby. Of the 32 *Eilat* sailors rescued after the explosion, most suffered significant internal abdominal and lung injuries without any external signs of bruising or injury, and required emergency surgery. These survivors had experienced "immersion blast injury," a phenomenon rarely seen in peacetime, but long documented in military medical tradition.

During World War I, Royal Navy medical officers reported instances of immersion blast injury among waterborne personnel exposed to exploding mines and depth charges. During World War II, repeated dive-bombing and torpedo attacks on ships often left the majority of a ship's company in the water after a direct hit. On those occasions, where a depth charge, mine, or torpedo exploded near swimming survivors, grave danger to life existed from water blast; death frequently occurred.

Reflections: The Necessity for Contingency Preparedness

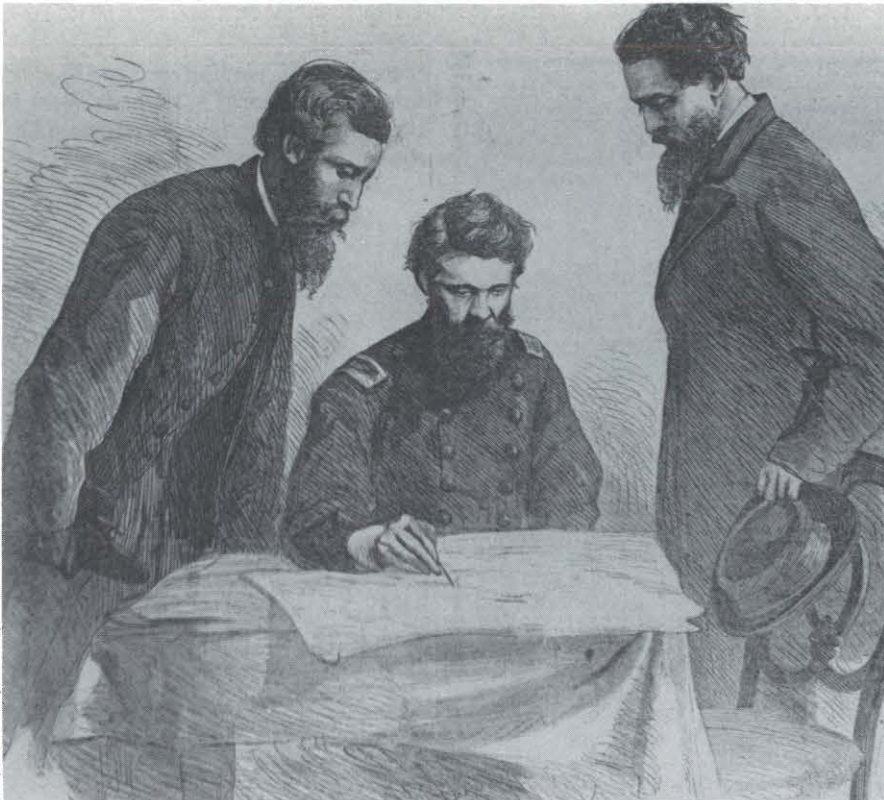
Due to a general downgrading of military infrastructure budgetary support, Navy medicine is currently faced with additional and at times conflicting and overpowering demands. The military medical services, for example, are beholden to a national peacetime preoccupation with reduction of CHAMPUS expenditures. Navy health care personnel are now viewed as integral instruments in this process of cost containment. Furthermore, the leadership is diligently attempting to retain accreditation of military hospital training programs (graduate medical education), by necessity obligating them to strive for accommodation with primarily civilian training standards. Therefore, fundamental questions following Operation Desert

Storm, such as whether active duty and reserve health care personnel possess adequate military specific professional training to prepare them for future wars (including wars at sea), or whether we really do have sufficient materiel preparedness for combat casualty care, can be easily forgotten.

The banishment of these military unique issues to a reduced priority level is nothing new. Peacetime challenges to programs for training medical personnel in the unusual facets of combat medical care, by raising questions of relative cost effectiveness, have historically and repeatedly relegated the precepts of military medicine to the status of heirlooms in an attic. There they have remained forgotten, only to be retrieved and dusted off whenever our national will is again tested in war. On each occasion, unfortunately, lives are expended in conflict until these precepts are rediscovered and implemented as if they were new insights, gleaned once again amidst the ongoing ravages of war.

The repeatedly validated axiom that military medicine must train its practitioners in peacetime for that which they will do in war, should never be forgotten! Any logical thinker must concur that contained within the lessons of history there are derived principles that warrant our continued respect. This certainly holds true for the profession of Navy medicine. Navy medical personnel must not suffer their professional heritage to be cast into oblivion by the undulating budgetary priorities of the moment. They must remain attuned to those harmful phenomena that characterize the Navy's unique maritime warfighting environment, and continue to maintain their vigilance and skill levels for the jobs that they will inevitably face during future conflicts at sea. □

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Luther B. Baker (left), COL Lafayette Baker, and Everton J. Conger plan the pursuit of John Wilkes Booth.

Identification and Autopsy of John Wilkes Booth: Reexamining the Evidence

Leonard F. Guttridge

Senator Garret Davis, KY: *I have never seen myself any satisfactory evidence that Booth was killed.*

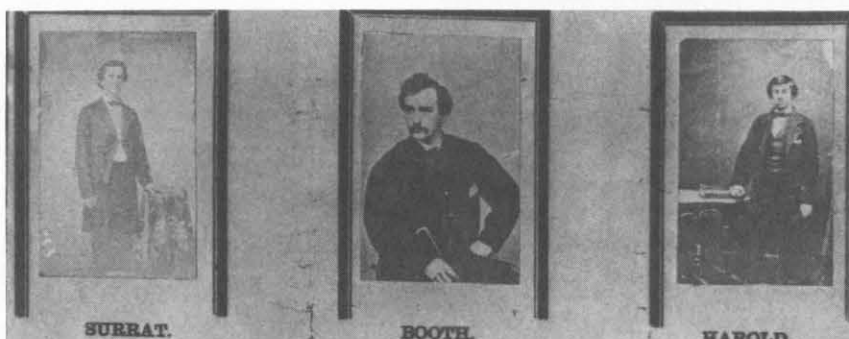
Senator Reverdy Johnson, MD: *I submit to my friend from Kentucky that there are some things that we must take judicial notice of, just as well as that Julius Caesar is dead.*

Senator Davis: *I would rather have better testimony of the fact. I want it proved that Booth was in that barn. I*

cannot conceive, if he was in the barn, why he was not taken alive. I have never seen anybody, or the evidence of anybody, that identified Booth after he is said to have been killed. Why so much secrecy about it? . . . There is a mystery and a most inexplicable mystery to my mind about the whole affair. . . . [Booth] could have been captured just as well alive as dead. It would have been much more satisfactory to have brought him up here alive

and to have inquired of him to reveal the whole transaction . . . [or] bring his body up here . . . let all who had seen him playing, all who associated with him on the stage or in the green room or at the taverns and other public places, have had access to his body to have identified it.

Senator Henry B. Anthony, RI: *I am happy to relieve my friend from Kentucky by informing him that a small part of the skeleton of Booth is in*



War Department, Washington, April 20, 1865,

 **\$100,000 REWARD!**

THE MURDERER

Of our late beloved President, Abraham Lincoln,
IS STILL AT LARGE.

\$50,000 REWARD

Will be paid by this Department for his apprehension, in addition to any reward offered by Municipal Authorities or State Executives.

\$25,000 REWARD

Will be paid for the apprehension of JOHN H. SURREAT, one of Booth's Accomplices.

\$25,000 REWARD

Will be paid for the apprehension of David C. Harold, another of Booth's accomplices.

LIBERAL REWARDS will be paid for any information that shall conduce to the arrest of either of the above-named criminals, or their accomplices.

All persons harboring or secreting the said persons, or either of them, or aiding or assisting their concealment or escape, will be treated as accomplices in the murder of the President and the attempted assassination of the Secretary of State, and shall be subject to trial before a Military Commission and the punishment of DEATH.

Let the stain of innocent blood be removed from the land by the arrest and punishment of the murderers.

All good citizens are exhorted to aid public justice on this occasion. Every man should consider his own conscience charged with this solemn duty, and rest neither night nor day until it be accomplished.

EDWIN M. STANTON, Secretary of War.

DESCRIPTIONS.—BOOTH is Five Feet 7 or 8 inches high, slender build, high forehead, black hair, black eyes, and wears a heavy black moustache.

JOHN H. SURREAT is about 5 feet, 9 inches. Hair rather thin and dark; eyes rather light; no beard. Would weigh 145 or 150 pounds. Complexion rather pale and clear, with color in his cheeks. Wore light clothes of fine quality. Shoulders square; cheek bones rather prominent; chin narrow; ears projecting at the top; forehead rather low and square, but broad. Parts his hair on the right side; neck rather long. His lips are firmly set. A slim man.

DAVID C. HAROLD is five feet six inches high, hair dark, eyes dark, eyebrows rather heavy, full face, nose short, hand short and fleshy, feet small, instep high, round bodied, naturally quick and active, slightly closes his eyes when looking at a person.

NOTE.—In addition to the above, State and other authorities have offered rewards amounting to almost one hundred thousand dollars, so that an aggregate of about **TWO HUNDRED THOUSAND DOLLARS.**

Thousands of "wanted" posters bearing John Wilkes Booth's likeness were in circulation within days of President Lincoln's murder.

the anatomical museum of the Surgeon General. . . . I do not know how it is identified, but it is certified to be that.(1)

Get Booth

On the afternoon of Monday, 24 April 1865, 10 days after John Wilkes Booth assassinated Abraham Lincoln, a Union army lieutenant, Edward P. Doherty, reported to Lafayette Baker's headquarters on Pennsylvania Avenue in Washington, DC. So did two men in whom Baker, the War Department's chief detective, placed principal confidence: his cousin, Luther B. Baker, and Everton J. Conger. Both had been Baker's close aides in a locally active military unit which, under his command, had conducted limited field operations earlier in the Civil War. They were now private citizens. Lafayette Baker reasigned them as "special detectives" carrying their former military rank and ordered them into Virginia to scour the country and "get Booth."

LT Doherty commanded the 16th New York Cavalry detachment assigned to the mission as an escort. An officer with combat experience, he did not relish subordinating himself to Baker's confidential agents. And with this simmering dispute over seniority, the party boarded the federal steam-tug, *John S. Ide* at the Sixth Street wharf and cast off at sundown.

They descended the Potomac River, disembarked at Belle Plain toward midnight, and crossed funnel-shaped King George County at its narrow westerly side, the neck between the Potomac and the Rappahannock Rivers. The two detectives separated from the main column and rode house to house, arousing inhabitants from sleep with shouted questions, Conger for no clearly stated reason passing himself off as "Boyd from Maryland."

(2)

National Archives

Garrett's Barn

Doherty's troops struck the Rappahannock at dawn and by afternoon were at a fisherman's cottage near the ferry where they displayed photos of John Wilkes Booth. Doherty pressed the fisherman, William Rollins, into service as a guide. By nightfall that Tuesday, all his 25 soldiers and the 2 detectives had crossed the river into Caroline County. Acting upon information from Rollins (or his wife), they rode into Bowling Green and at the Star Hotel hauled a young ex-Confederate army private named William Jett from his bed at gunpoint. And with Jett now their guide, the cavalry galloped back up the rutted highway to the farm of Richard H. Garrett. Two men were sheltered there. One was a Washington youth named David E. Herold. The other was older, had a bandaged leg, and supported himself on crutches. He had presented himself to the Garretts as a wounded Confederate officer; one of his forearms bore the tattooed letters JWB, and he had given his name as James W. Boyd.

After forcing the Garretts to reveal that the pair slept within their large tobacco barn, the troops surrounded it, Luther Baker shouting for the men inside to surrender. The lame man, called Boyd, demanded to know why he should do so and asked repeatedly who was besieging him.

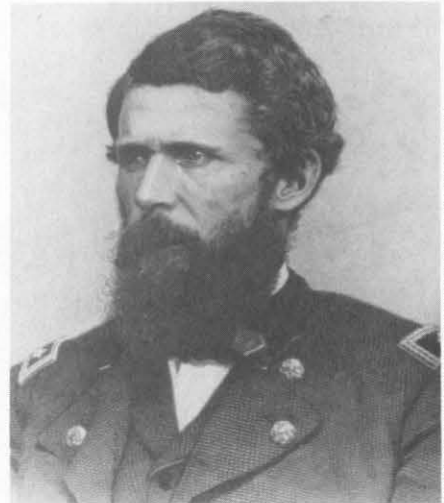
There followed through the locked barn door a verbal give-and-take during which no names were ever volunteered. Herold chose to give himself up and the door was unlocked for him to come out. As the soldiers seized the young man and tied him to a tree, he maintained that his companion in the barn "told me his name was Boyd."⁽³⁾ Over LT Doherty's objections, detective Conger moved to the rear of the barn and set it afire.

Between the barn's gaping side timbers its sole occupant could be seen, a stumbling silhouette against the gathering blaze until a shot rang out and he fell. The bullet had passed through his neck, shattering vertebrae and severing the spinal cord. Luther Baker reached him first, then Conger

rushed into the barn exclaiming that the man had shot himself. Baker thought Conger had fired the bullet but "the idea flashed through my mind that if he had it had better not be known."⁽⁴⁾

They took the man's weapons, a Spencer carbine and two pistols, carried him first to the foot of a locust tree and then, as fire enveloped the barn, the Garrett's front porch, where he was placed with a mattress beneath his head. One of Doherty's soldiers rushed to Port Royal for a doctor, whose name, Charles Urquhart, would eventually surface—but not so any record of his strange house call, nor a death certificate; nothing at all for posterity beyond the impression that after examining the mortally wounded man, the doctor merely closed his bag and rode off into the predawn gloom, never to be heard from.

The man survived the shooting about 3 hours. While he still breathed, Conger emptied his pockets, the con-



From *The History of the United States Secret Service*

Lafayette C. Baker, the War Department's chief detective

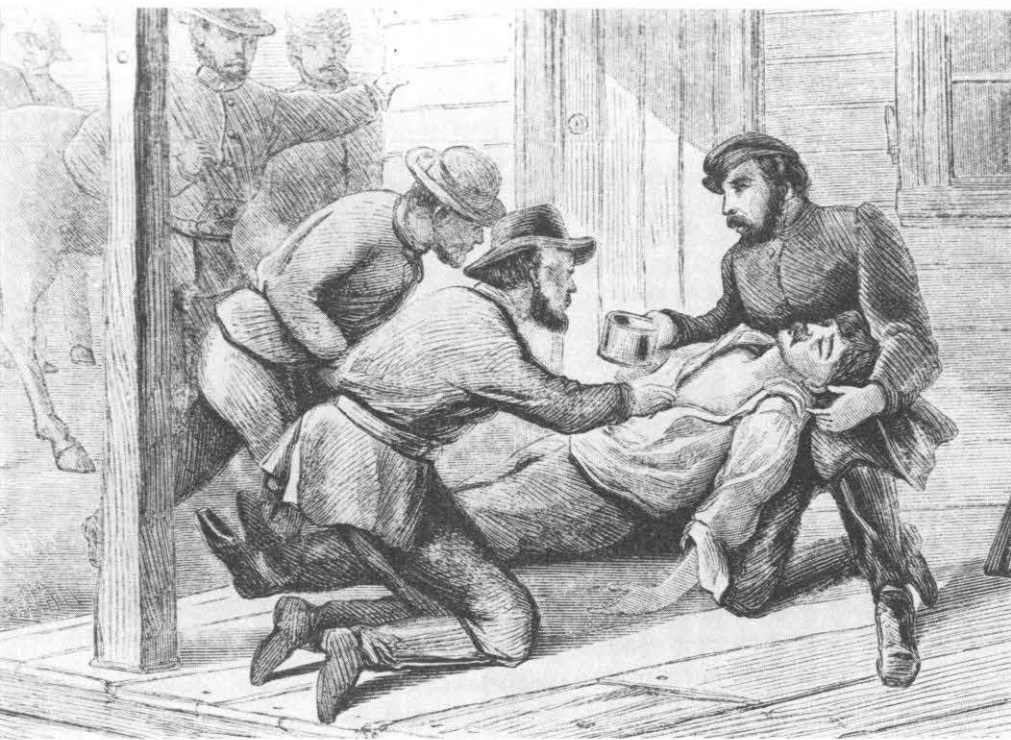
tents of which included a little book in which the Garretts had seen "Mr. Boyd" writing.⁽⁵⁾

Conger set out at once with these items for Washington. Accompanying him as far as the steamboat landing at

Harpers Weekly, 13 May 1865



This is how *Harpers Weekly* portrayed Booth's final stand in Garrett's barn.



From *The History of the United States Secret Service*

An illustration from Lafayette Baker's memoir portrays the assassin's last moments.

did not act as severely as I should have done with Mr. Baker."(8)

Shortly before 11 p.m. the party with the body arrived off Alexandria where Lafayette Baker took charge of it. There ensued an unexplained delay of at least 3 hours before it was transferred to a tug and borne across the Potomac to the Washington Navy Yard. What followed is described in a testy letter written by LCDR Edward E. Stone, commanding officer of the ironclad monitor USS *Montauk*, laid up in the yard for battle repairs. Stone had been ashore at the time but learned from his officers that:

a tug came alongside, on board of which was Colonel Baker, the detective, with a dead body, said to be that of J.W. Booth, the assassin. Said body was passed on board with the implied understanding that it had been put on board for safe-keeping. No orders whatever were left with the officer of the guard or the commanding officer . . . concerning it, nor was any written authority for so disposing of it shown to any officer of the vessel. It was a most informal and unmilitary proceeding, which should have been nipped in the bud.(9)

Following anxious word from the commandant of the Navy Yard that the body was "changing rapidly. What disposition shall be made of it?,"(10) the Secretaries of War and Navy conferred before breakfast then sent a reply across town:

You will permit Surgeon General Barnes and his assistant, accompanied by Judge Advocate Genl Holt, Hon John A. Bingham,* Special Judge Advocate, Major Eckert, Wm G. Moore, clerk of the War Department, Col. L.C. Baker, Lieut. Baker, Lieut. Col. Conger, Chas Dawson, J.L. Smith, Gardiner [sic] (photographer) + assistant, to go on board the *Montauk*, and see the body of John Wilkes Booth.

Immediately after the Surgeon General has made his autopsy, you will have the body placed in a strong box, and deliver it to the charge of Col. Baker—the box being carefully sealed.(11)

*John A. Bingham, a former congressman from Ohio, later served as the only civilian on the commission that tried the alleged Lincoln assassination conspirators.

Belle Plain was SGT Boston Corbett, a former hatter and religious mystic who had rechristened himself after the city in which he claimed to have been born again. Upon arrival in the Capital, Conger officially reported that President Lincoln's killer had been tracked down, cornered, and shot while trying to escape, and that SGT Corbett had pulled the trigger.

Conflict and Myth

The foregoing paragraphs recount all that can reliably serve to convey what occurred at Richard Garrett's farm on that April night nearly 128 years ago. Impartial study shows that much else told and retold ever since purporting to detail the capture and demise of John Wilkes Booth is so riddled with conflict and myth as to be necessarily viewed with caution, if not dismissed outright.

This is significantly the case respecting the captive's alleged last words. The detectives Conger and Baker testified that at different moments he muttered, "Tell Mother I died for my country," "I did what I thought was for the best," "Kill me, oh, kill me," "Did Jett betray me?" "My hands," and finally, "Useless, useless." LT Doherty's report to his superiors contains no reference to any dying utterances and 20 years later he publicly denied that

any were made with the exception of "Useless, useless."(6) On this point, the last word might be granted the Surgeon General of the Army who conducted an autopsy on the body from Garrett's farm: "Immediately after the reception of the injury, there was very general paralysis . . . deglutition [swallowing] was impracticable and one or two attempts at articulation were unintelligible."(7)

If such differences in testimony are traceable to rivalry for reward money, this possibility alone justifies circumspection. At any rate, not even the record of the body's 18-mile journey from the Rappahannock crossing to the Belle Plain landing is without its bizarre aspects. Luther Baker and a two-man military guard had charge of it and once across the river at Port Royal, the detective pushed on ahead of the troops, much to Doherty's consternation. As the lieutenant afterwards stated, "under some pretense or other [Baker] managed to send the guard back to me with some frivolous message and stole away with the body." And when Doherty reached Belle Plain, the corpse was nowhere in sight. After it had belatedly appeared, to be placed aboard the waiting steamer, Baker blamed his ex-slave wagon driver for taking the wrong road. Said Doherty in later years, "I

All but 3 of the 13 cited in the above order were connected with the War Department. The exceptions were the photographers Alexander Gardner and his assistant Timothy O'Sullivan, and Dawson, the latter a clerk at the National Hotel where the assassin had frequently stayed. The wording of the order reflects an official presupposition that the body was indeed Booth's. If the nation (and posterity) wanted more convincing identification, the proceedings aboard the floating iron-clad during the next few hours would have to suffice.

A Parade of Witnesses

The weather that Thursday forenoon was warm for April, the *Montauk's* armorplate hot to the touch. The body from Garrett's farm lay on a bench alongside the rotatable gun turret, an awning mercifully shielding it from the sun's rays. Shortly before noon, Joseph K. Barnes, Surgeon General of the Army, had come on board "and without informing any

officers who he was, or seeming to pay the slightest respect to Military etiquette . . . walks up to the corpse and commences to cut adrift the wrappings."⁽¹²⁾ Testimony was taken, but not from LT Doherty. First thing that morning, Lafayette Baker had promised him career advancement and reward money. But since "publicity might frustrate plans," Doherty was ordered to "go to your barracks and keep your mouth shut."⁽¹³⁾ Also "disposed of. It cannot be found," according to Luther Baker, was "a sworn statement" he made before Joseph G. Holt, Judge Advocate General of the Army, "before I gave up the body. I was the first to give evidence."⁽¹⁴⁾

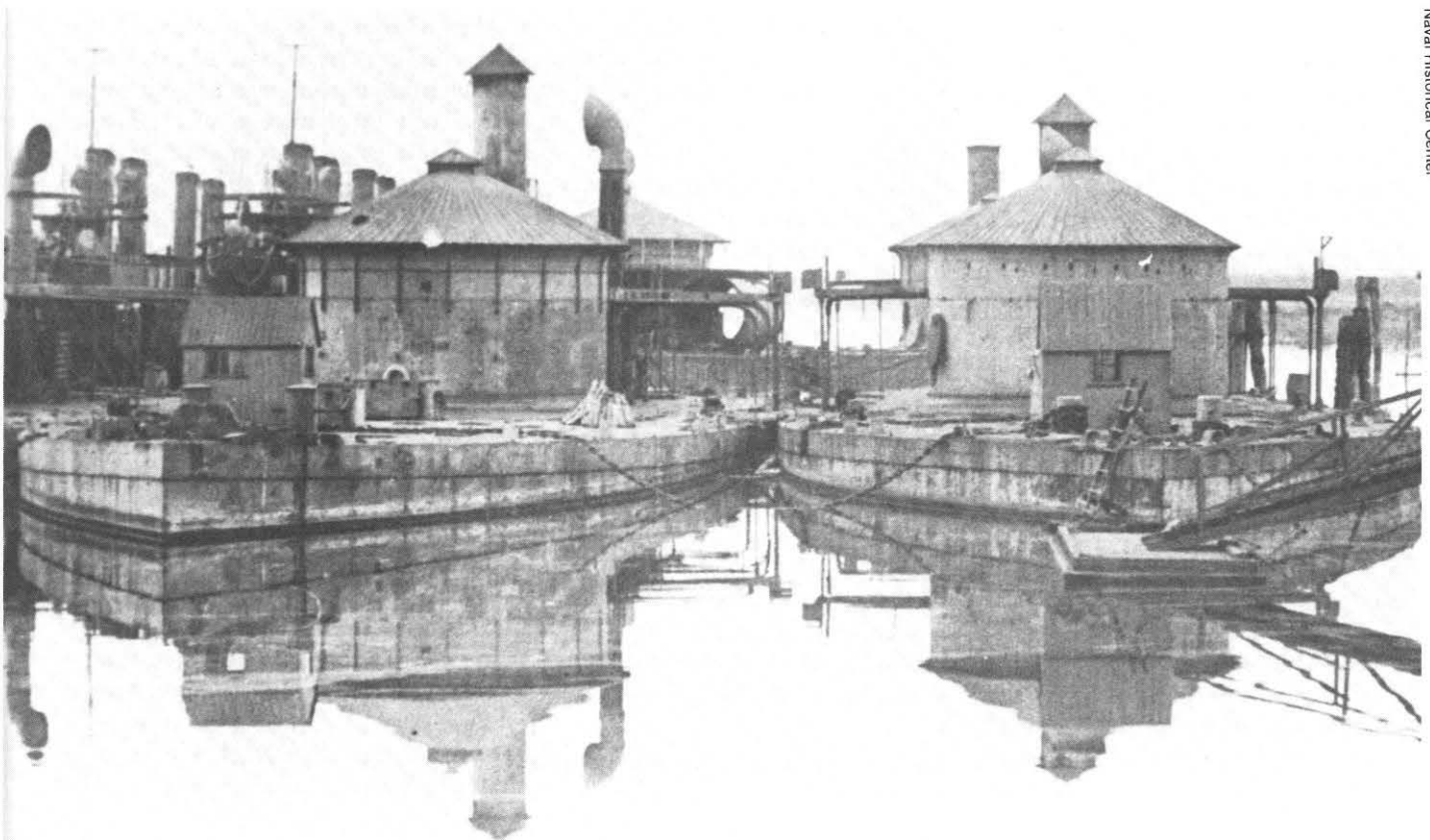
In the pilot room over the turret, Holt and Bingham, the "Special Judge Advocate," took depositions and hurried through an abridged set of questions. The hotel clerk Dawson, the only private citizen other than the photographers authorized to "see the body of John Wilkes Booth," claimed to have been "merely as intimate [with

the actor] as I would be with any guest in the hotel. I distinctly recognize [the body as Booth's]—first from the general appearance, next from the India ink letters J.W.B. on his wrist." Which wrist? "The left."⁽¹⁵⁾ (Booth's initials were on his right arm, according to a letter the War Department had just received from the Army's provost marshal general at Baltimore.)

For reasons not officially explained, decisions were made to secure additional "witnesses." Conveniently at hand, the captain's clerk on *Montauk* claimed to have known Booth personally "about six weeks . . . and recognized [the body] when it was brought on board . . . from the general appearance."⁽¹⁶⁾

The *Montauk's* acting-master, William W. Crowninshield, had also "known Booth" 6 weeks, "was introduced to him on two different occasions. He was about five feet nine and threequarter inches high." To this oddly meticulous estimate, Crowninshield added that he identified the

USS *Montauk* (left) at the Philadelphia Navy Yard about 1902.



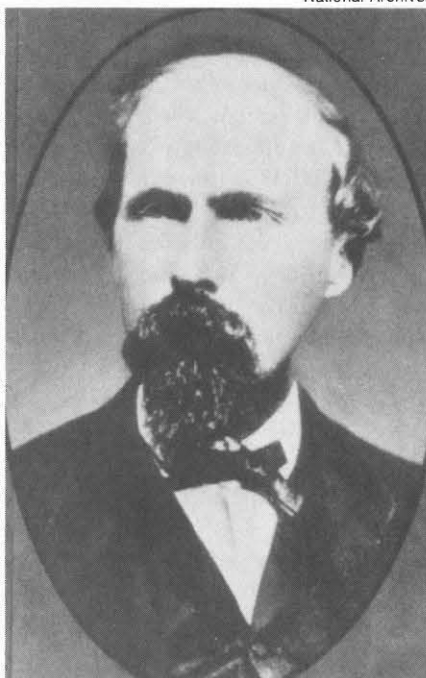
The Doctors (left to right): Samuel Mudd set Booth's broken leg, Joseph K. Barnes directed the autopsy on *Montauk*, assisted by Joseph J. Woodward. John Frederick May's contradictory testimony left several questions unanswered.

body "from my knowledge of its general appearance." (17) A Washington lawyer related to *Montauk's* marine captain had "met [Booth] one evening at a 'hop' at the National Hotel" and recognized the cadaver as Booth's from its "general appearance . . . I do not think I can be mistaken." (18)

Though readily approachable in the city of Washington, no stage acquaintances of John Wilkes Booth viewed the body. No personal friends or relatives of the actor were summoned to identify him. Some of Booth's co-conspirators in an alleged assassination plot were actually on *Montauk*, shackled within the windlass room and the sail room, but they stayed there. Almost as if to explain why no categorical evidence was sought, it would be reported that "the shaving off the mustache, the outcropping of the beard, the untidy and disordered appearance of the body, had so changed the assassin's look that his stage and street acquaintances would hardly have recognized the corpse as that of John Wilkes Booth." (19) At the same time, newspapers reported that the War Department was in possession of Booth's diary, but 2 years would pass before there was any official announcement to this effect.

That Booth had indeed shaved off his mustache was reliably reported to the War Department, also that he had fractured a bone in his left leg. Records do not show who, if any, of the "witnesses" on *Montauk* were aware of those reports. Booth had rid himself of the mustache on 15 April at the home of the Maryland physician, Samuel Mudd, who set his fractured limb. In Virginia, one of Richard Garrett's daughters would remember that their visitor, "Mr. Boyd," wore a mustache. (20) After Alexander Gardner

National Archives



photographed the body aboard *Montauk*, his assistant, Timothy O'Sullivan, carried the plate to their studio accompanied by a government detective under orders to take possession of both plate and print once it was developed. He was then to deliver these items to the Secretary of War or Lafayette Baker. "[I] even went into the dark room," the detective remembered. He had not seen the body on *Montauk* itself, but on his way to the War Department he peeked into the envelope containing the picture. "It looked just like the pictures attached to the [reward] posters except that the hair was longer on the sides, the mustache was shaggy and dirty. . . . I think it was Booth. . . ." (21)*

Everton Conger was asked if "the body on board this boat, which has been recognized by other witnesses as that of John Wilkes Booth, is the man killed by you?" Conger replied yes, and as for recognizing him at Garrett's farm, he did so "from his resemblance to his brother. I had often seen his brother, Edwin Booth, play in the theater." On the same point, Luther Baker testified that he had turned the fallen man over, "looked at his face,

*Both the photographic plate and the single print disappeared.

National Museum of Health and Medicine



and saw it was Booth's, judging by the likeness I had." (22)

As if to enhance the credibility of the proceedings aboard *Montauk*, yet one more witness was required. Lafayette C. Baker, as head of Secretary of War Edwin M. Stanton's detective corps, had already acquired the wartime reputation of a scheming bully upon whose say-so innumerable citizens, innocent and guilty alike, were locked up in the Old Capitol Prison. When Baker came calling in person on Dr. John Frederick May to identify the remains on *Montauk*, "I deemed it most prudent to obey." (23) But when he stood by the crude bier and the tarpaulin cover was removed, May at once turned to Surgeon General Barnes and said, "There is no resemblance in that corpse to Booth, nor can I believe it to be him." (24)

Washington-born and eminent in the fields of medicine and surgery, May was middle-aged and married with six children. That he was believed to have once removed a tumor from Booth's neck was the stated reason for his appearance on the monitor. After his initial astonishment, he asked if the body had a scar on the back of its neck and Barnes said it had. Presumably, it would not be a neat scar, as Booth had reopened the wound during a subsequent stage performance. More likely, it would now resemble "a large, ugly looking scar instead of a neat line. [Barnes] said it corresponded exactly



with my description.”(25) Does [May] recognize the body as Booth’s? “I do . . . though it is very much altered. It looks to me older . . . more freckled. I do not recollect that he was at all freckled.” The doctor could not be mistaken? “From the scar [and] the features, which though much changed and altered, still have the same appearance, I think I cannot be mistaken. I recognize the likeness. I have no doubt. . . .”(26)

Autopsy

Joseph K. Barnes was a Harvard-schooled doctor on close terms with Secretary of War Stanton, to whom he owed his status in the sphere of military medicine. Two weeks before, Barnes had been one of a half dozen physicians engaged in the postmortem examination of the slain President. Now he would conduct an autopsy on the body just identified as the assassin. Barnes was assisted by Joseph J. Woodward, a brilliant young researcher in photomicrography at the recently established Army Medical Museum, then located two blocks east of the White House. Afterwards, Woodward wrapped in brown paper the cervical vertebrae and spinal cord showing the track of the bullet. These he carried to the Museum where in due course they were mounted and catalogued. Surgeon General Barnes meanwhile wrote to Stanton that the cause of death was “a gunshot wound in the neck—the ball entering just

behind the sterno-cleido muscle 2½ inches above the clavicle, passing through the bony bridge of the fourth and fifth cervical vertebrae—severing the spinal cord and passing out through the body of the sterno-cleido of the right side, 3 inches above the clavicle. Paralysis of the entire body was immediate.”(27)

Barnes referred to a “gunshot wound.” *The Catalogue of the Surgical Section of the United States Army Medical Museum*, published under his direction in 1866, describes the wound as caused by:

a conoidal carbine bullet [that] entered the right side, comminuting the base of the right lamina of the fourth vertebra, fracturing it longitudinally and separating it from the spinous process, at the same time fracturing the fifth through its pedicle and involving that transverse process. The missile passed directly through the canal with a right inclination downward and to the rear, emerging through the left bases of the fourth and fifth laminae, which are comminuted, and from which fragments were embedded in the muscles of the neck. The bullet in its course avoided the large cervical vessels.(28)

Without mentioning names, the catalogue numbers the specimens of vertebrae and spinal cord—“From a case where death occurred a few hours after injury, 26th April 1865”—as 4086 and 4087. The year 1875 saw publication of *The Medical and Surgical History of the War of the Rebellion (1861-65)*, also under Dr. Barnes’ direction. The cases reported here are generally identified each by the name of the soldier victim, but in a section

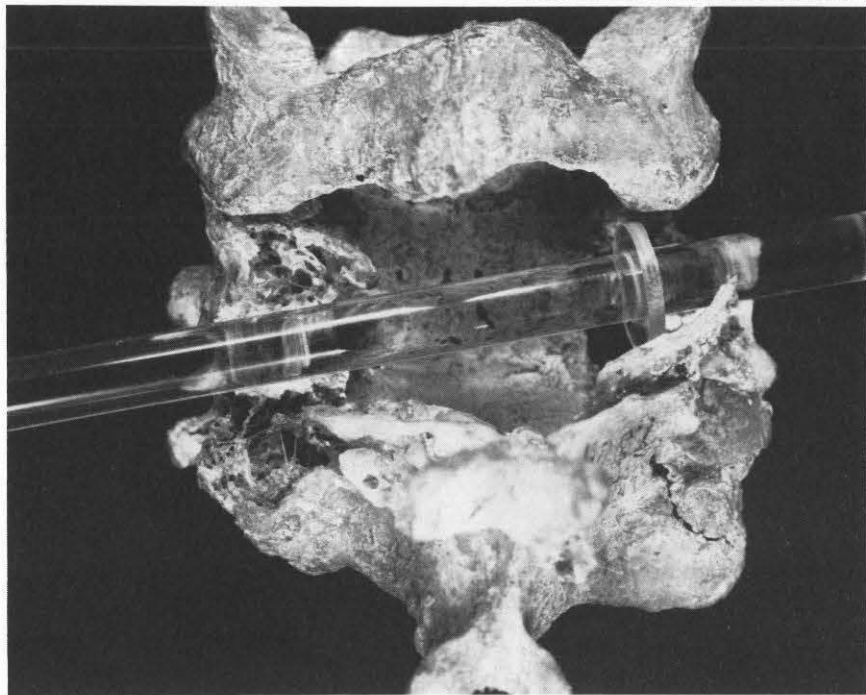
headed “Wounds and Injuries of the Spine” appears: “CASE—J.W.B.—was killed on April 26th 1865, by a conoidal pistol ball, fired at the distance of a few yards from a cavalry revolver.”(29) The details that follow conform with the catalogue entry and go on to state the impracticability of deglutition on the part of the victim and the unintelligibility of his “one or two attempts at articulation.”(30) At the National Museum of Health and Medicine (today part of the Armed Forces Institute of Pathology), the original card attached to Specimen 4086 quotes the catalogue text, but shows word erasure and substitution done in 1931 to make it read “pistol ball,” thus corresponding to the text in *Surgical History*.

The corpse had a proclivity for disappearing acts. LT Doherty had lost it on the trail back from Garrett’s farm. The macabre sleight of hand was repeated at the Washington Navy Yard whose commandant, John B. Montgomery, a veteran of the War of 1812, made known his ire and bafflement. “The removal of the body [from *Montauk*] was entirely without my knowledge . . . suddenly and unexpectedly removed. . . . This unusual transaction deprived me of opportunity for enclosing the body in a box . . . as ordered.”(31)

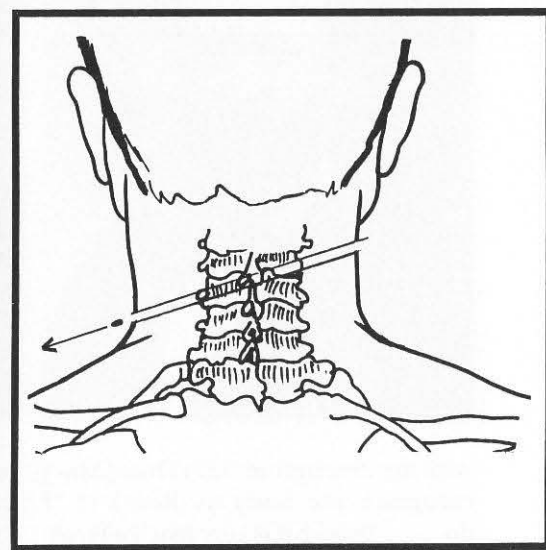
LCDR Stone (shortly thereafter to be replaced as *Montauk*’s captain by his acting-master, one of the identifiers) angrily likened the body’s departure to its furtive arrival. “I’m sorry to say that I was not present at either time or I should have put a stop to it.”(32)

The Disposition

Under Lafayette Baker’s supervision, the body was taken in a boat to the grounds of Washington’s old penitentiary, in wartime use, an arsenal. Partly shrouded in a gunny sack, it lay awhile in a small summer house upon a jetty. An inquisitive passerby glimpsed its face and “recognized it [as Booth’s] from posters and circulars.”(33) Its next stop was in one of the old cells, then serving as an ordnance store-room, where it was quickly interred.



Art by Moses Jackson, NSHS



A lucite rod traces the path of the bullet that killed the man in Garrett's barn (posterior and anterior [opposite page] views). It may be noted that Surgeon General Barnes' contradictory descriptions of the wound, neither of which are wholly supported by the anatomical specimens, cast further doubt on the reliability of the identification and autopsy.

Two years later, during structural renovation, the remains were transferred to another part of the facility. That same year the War Department made public the diary entries Booth had written while a fugitive, Conger testifying that the booklet containing them was taken off the man killed at Garrett's farm.(34) Many of its pages had clearly been cut away. Conger, Stanton, and Thomas T. Eckert, his close aide and chief of the military telegraph, all stated that the booklet was in the same mutilated condition when they had first seen it.(35) Lafayette Baker, by that time no longer in government service, testified to the contrary.(36)

Early in 1869, after Stanton's departure from the War Department and in belated response to requests from Edwin Booth, the remains were taken up yet again and removed to a Baltimore undertaker for transfer to the Booth family. There was more talk of identification, and this time to be confirmed by location of a plugged tooth in the skull.(37) Joseph, youngest of

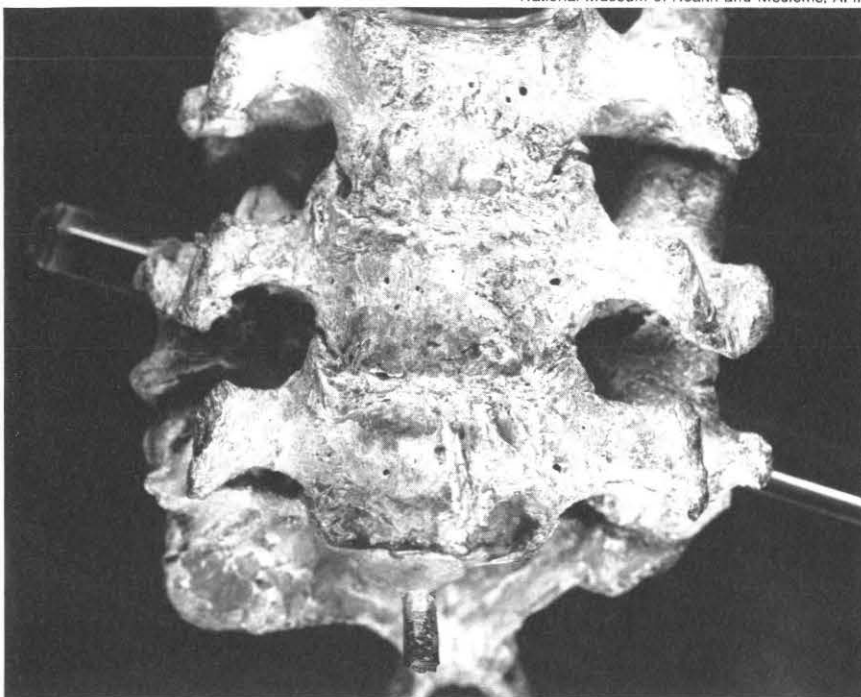
the Booth brothers, supervised the proceedings. Edwin was not present. Eyewitness recollections, most published decades later, contained references to physical features but at the time it was locally reported that "the flesh [has] disappeared, leaving nothing but a mass of blackened bones."(38)

Dr. Mudd, when under arrest for alleged complicity in Lincoln's murder, had described Booth's leg injury as "a straight fracture of the tibia about two inches above the ankle. There was nothing resembling a compound fracture."(39) In his letter to Secretary Stanton after the autopsy on *Montauk*, the Army Surgeon General had stated that "the left leg and foot were encased in an appliance of splints and bandages, upon the removal of which, a fracture of the fibula (small bone of the leg) 3 inches above the ankle joint, accompanied by considerable ecchymosis, was discovered."(40) In *Montauk's* pilothouse that sultry April Thursday no questions had been asked about the leg. However, shortly

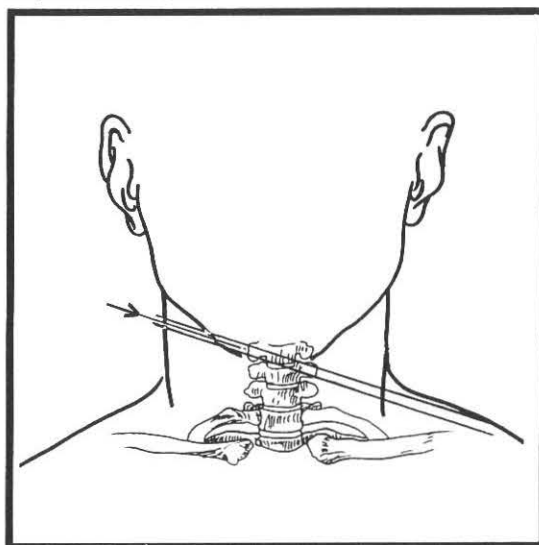
before his death in 1891 Dr. May composed a memoir in which he attributed his identification of the body to "my mark . . . unmistakably found by me upon it. Never in a human had a greater change taken place . . . every vestige of resemblance to the living man had disappeared. But the mark of the scalpel during life remained indelible in death" settling once and for all "the identity of the man who had assassinated the President." And the leg? "The right limb was greatly contused, and perfectly black from a fracture of one of the long bones. . . ." (41)

An old man's memory playing him false? This was suggested more than 30 years later and drew a response from May's son, also a doctor. His father's statements were unfailingly reliable. If he said that the right leg was bruised and discolored, "that would undoubtedly mean that it was the right leg that was broken."(42)

Letters that reflected puzzled or suspicious minds reached the desk of the Judge Advocate General of the Army. They had come to the right place. In



Art by Moses Jackson, NSHS



his memoir Dr. May refers to "a commission of high functionaries of the government formed to obtain evidence as to [Booth's] identification."⁽⁴³⁾ The "commission" was Judge Advocate General Joseph Holt and his assistant Bingham, and the statements they took on *Montauk* were appropriately filed in the Judge Advocate General's office, as was documentation detailing the search for Booth and the capture at the Garrett farm. The record of the manhunt and of the ritual on *Montauk* was from the beginning, and would remain, part of the archives of that office. One of the inquiring letters, in 1912, asked "what became of John Wilkes Booth and whether there is positive proof of his having been shot to death?"⁽⁴⁴⁾ The Judge Advocate General replied that "This office has no official information concerning the pursuit and capture of John Wilkes Booth."⁽⁴⁵⁾ And when, 3 years later, the secretary of the Washington, DC, based Columbia Historical Society sought the names of the "high functionaries" mentioned by May, the response, from the same Judge Advocate General, was that "this office has no official reports or information concerning the capture and killing of Booth, nor as to what means, if any, were taken to identify the body of the

man brought to the Navy Yard at Washington as that of the assassin."⁽⁴⁶⁾

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The Forensic Evidence

For this article, *Navy Medicine* requested that a study be made of the cervical vertebrae and spinal cord section recovered by Dr. Joseph Woodward following the autopsy aboard USS *Montauk*. A team of forensic pathologists and anthropologists from the National Museum of Health and Medicine and the Armed Forces Institute of Pathology in Washington, DC, were able to establish that the fatal wound, caused by a large caliber, low velocity weapon, entered the neck high on the right side, traversing downward and exiting the neck low on the left side. There is no evidence that the wound was self-inflicted, putting to rest one hypothesis that the

man in Garrett's barn may have shot himself. The posterior aspect of the spinal cord exhibits severe damage consistent with quadriplegic paralysis. The spinal cord's anterior aspect is intact, indicating that respiration might have continued for several hours.

With such a small sample to study, the scientists were unable to determine the precise age or identity of the victim, only that he was a young to middle-aged adult. A forensic study of the long bones and skull augmented by the use of video superimposition could establish once and for all whether the body of John Wilkes Booth reposes in Baltimore's Green Mount Cemetery. —JKH

Naval Medical Research and Development Command Highlights

• Tissue Oxygen Pressure as an Index of Wound Healing

A current multicenter cooperative study funded by the Naval Medical Research and Development Command (NMRDC) and coordinated by researchers at the Uniformed Services University of the Health Sciences (USUHS), Bethesda, MD, is evaluating the clinical utility of a new oximeter (Optode). The Optode has the potential to improve postoperative treatment of severely injured combat casualties by ensuring optimal tissue perfusion and increasing the rate of wound healing. The Optode provides on-line reading of the oxygen tension in subcutaneous tissues (Psq02) based on the principle of fluorescence quenching by oxygen. Studies are being conducted to compare readings obtained from the Optode with other indices of wound healing in patients recovering from severe injury when wound healing may be compromised. On-line measurement of Psq02 will identify patients, otherwise undetected, in whom the tissue pressure of oxygen has fallen to levels associated with impaired wound healing. The study involves three level I trauma centers (the Medical College of Virginia, Richmond, VA; the Med Star Unit of the Washington Hospital Center, Washington, DC; and the Sinai Hospital of Baltimore, Baltimore, MD) and the Departments of Surgery at the University of California at San Francisco, USUHS, and the National Naval Medical Center, Bethesda, MD. For more information contact CDR P.D. Kent, MC, NMRDC Research Area Manager for Combat Casualty Care, DSN 295-0880 or Commercial 301-295-0880.

• Neuropeptide Y on the Acquisition and Performance of Response Sequences During Heat Stress

Maintaining optimal troop performance under conditions of thermal stress is of paramount importance to fleet operations. Well-trained Navy and Marine Corps personnel are often required to work in hot environments and perform complex tasks to satisfy mission requirements (i.e., missile launch operators, pilots, navigators, SONAR operators, artillery fire direction teams, and SEALs). This thermal stress appears capable of degrading cognitive performance (learning and memory) through alterations of neuropeptides in specific areas of the central nervous system. The basic mechanisms of how thermal stress-induced neuropeptide releases effect learning have not been well defined. A team of researchers in the Thermal Stress Adaptation Program at the Naval Medical Research Institute,

Bethesda, MD, are examining the role of neuropeptide Y (NPY) in mediating thermal stress-induced effects on cognitive functions. NPY may have an important role in the mechanisms by which thermal stress disrupts human cognitive behavior. NPY is a 36 amino acid polypeptide that has been shown to be involved in vertebrate stress responses and influences the acquisition and performance of response sequences in an animal model. The information generated by this research is essential for developing a neuropharmacological strategy to prevent and treat thermal stress effects on performance in operational environments. For more information contact CDR P.D. Kent, MC, NMRDC Research Area Manager for Combat Casualty Care, DSN 295-0880 or Commercial 301-295-0880.

• Cytokines Modulate the Immune Response to *Campylobacter* Infection

Campylobacteriosis is recognized as one of the most common bacterial infections causing acute diarrhea and bacterial gastroenteritis in military personnel throughout the world. Investigators at the Naval Medical Research Institute, Bethesda, MD, recently reported some intriguing new information of the ability of certain cytokines to control *Campylobacter jejuni* infection in mice. After establishing infection in the mouse intestine, the investigators measured the levels of circulating (serum) and local (mucosal) cytokines and anti-campylobacter antibodies developed in response to the infection. Also analyzed were the effects of orally administered pure recombinant cytokines on the rate of campylobacter elimination from the intestine. It was determined that certain cytokines, most notably interleukin-6 (IL-6), were important modulators of *Campylobacter jejuni* infection. After infection, the level of IL-6 increased quickly at the mucosal level, peaking after 3 days. When infected mice were fed recombinant IL-6, there was a rise in the production of secretory IgA antibodies and an immediate (24 hours) 1,000-fold reduction in the bacterial load in the gut. The mechanism(s) of these cytokines effects is not known. However, the cytokine activities observed using this mouse model of campylobacter infection, along with the increasing availability of pure recombinant cytokines, give promise to the potential use of cytokines in advanced treatment of campylobacter diarrheal disease. For more information contact Ms. Christine Eise-mann, NMRDC Associate Director for Research Management, DSN 295-0882 or Commercial 301-295-0882.



Navy Medicine

January-February 1943

Jennifer Mitchum

January 1943 dawned on Allied forces much like a morning sun on a new day. The close of 1942 was very different from that of the year before coming on the heels of Pearl Harbor and the fall of Manila.

In the Atlantic and Mediterranean theaters, Allied troops were entrenched in French North Africa and plans for upcoming invasions were in progress. President Franklin D. Roosevelt, British Prime Minister Winston Churchill, and the Combined Chiefs of Staff met in Casablanca from 14 to 23 Jan to plan the Sicily invasion and cross-channel amphibious assaults on Western Europe. In addition, the North African command was designated as United States Naval Forces Northwest African Waters with its headquarters at Algiers.

RADM Ross T. McIntire, Navy Surgeon General, accompanied President Roosevelt and informally assessed the Navy medical situation in

the area, visiting the dispensary at Casablanca which had been established there in December.

New medical facilities were also established in other parts of French North Africa. Navy medical personnel established a permanent dispensary at Safi on 1 Jan. Initially, they had set up a first-aid station there in November shortly after landing. Similarly, Navy medical personnel opened a dispensary at Port Lyautey on 1 Feb. Prior to the dispensary's establishment, medical units of USS *Barnegat*, anchored in the Sebou River, along with medical beach parties, and Patrol Squadron (VP-73), which arrived in November from Iceland to set up a sick bay, met the areas medical needs.

Guadalcanal

In the Pacific, the Guadalcanal campaign had entered its final stages. The last day of 1942, Japanese Emperor Hirohito gave Japanese commanders

permission to evacuate the island and accept U.S. victory.

The last days of action were relatively quiet with the enemy falling back to Cape Esperance. As front lines shifted further westward, U.S. forces saw signs of enemy demoralization everywhere. When they overran Japanese bivouacs they found the enemy badly starved and ill living in dugouts among dead and decomposing bodies.

Coinciding with the enemy's shift to Cape Esperance was sudden increased activity by the "Tokyo Express" with large formations of destroyers and barges operating in the Guadalcanal area. While the Allies speculated that they carried reinforcing troops, the opposite was true. The evacuation of the more than 11,000 Japanese troops from Guadalcanal had begun. This was completed on the night of 7-8 Feb and by the following day, organized enemy resistance on Guadalcanal ended.

U.S. troops spent the weeks immediately following the First Marine Division's evacuation consolidating the lines. The First had been sent to Australia to re-outfit and reorganize. The Army had stepped in and assumed most of the responsibility for the island. On 4 Jan, the Sixth Marine Regiment arrived to relieve the Second and Eighth Marine Regiments which were both weakened by disease and casualties.

As with every battle there was a stiff price for victory. Marine units lost a total of 137 officers, 3 warrant officers, and 1,102 enlisted men KIA, MIA, and died of wounds.⁽¹⁾ The First Marine Division suffered the heaviest of these casualties with 636 killed, 52 died of wounds, and 1,537 wounded. (2) Three Medical Corps officers and 11 hospital corpsmen serving with the First were killed in action.

Those ailing from disease coincided with battle casualties. Malaria continued to be a problem even after fighting ceased. Consequently, the Malaria Control Commission, headed by LCDR James J. Saper, MC, launched an intensive mosquito eradication campaign which resulted in a marked drop in the incidence of disease on Guadalcanal.⁽³⁾

The First and Second Marine Divisions reported high incidence of malaria once in Australia and in New Zealand, respectively, as those previously infected began to show signs of the disease. Shortly after the patients' arrival in Australia, there was an average of 250 admissions for malaria daily from among the approximate 13,000 men who had been in the Guadalcanal area.⁽⁴⁾ Quinine and Atabrine were used as suppressive agents either singularly or somehow combined. Despite the antimalarial treatment, the admission rate for malaria remained high.

Pacific Hospitals

The high incidence of disease in troops coming from battle areas severely taxed Pacific mobile and base hospitals. In December, Mobile Hospital No. 6 (Mob-6) in Wellington, the

hospital census increased to about 800. Later on, a large number of psychiatric patients, mainly marines and Army troops, arrived at the hospital in January 1943. For the most part, Navy medical personnel evaluated this group and evacuated them. The largest influx of patients to Mob-6 were patients with recurring malaria. In Feb 1943, the hospital census reached its highest point to date with over 1,000 patients admitted as recorded on 23 Feb.⁽⁵⁾ Malaria was the dominating medical problem; 61 percent of those admitted had malaria.⁽⁶⁾ Despite escalating admissions, the death rate at Mob-6 remained low with a total of six deaths occurring between 20 Sept 1942 and 24 Feb 1943, two of which occurred in February as a result of benign and malignant tertian malaria.⁽⁷⁾

There was also a rapid rise in malaria cases at Mob-4 Auckland as well. It was reported that in one group brought to the hospital, 80 percent had or subsequently developed malaria.⁽⁸⁾ On 1 Jan, Mob-4 had a combined bed capacity with the hospital and the receiving barracks at what was called the Auckland Domain of about 2,124. From the arrival of the first patients in August 1942 until 1 Jan 1943, 3,977 patients had been treated at Mob-4.⁽⁹⁾ The majority were war casualties evacuated from other South Pacific hospitals. Most of the patients returned to duty but a sizable number were evacuated to the United States for further treatment and disposition. Periodically, some patients were transferred to Mob-6 Wellington to relieve overcrowding. On 23 Feb, a hospital staff recreation camp opened at Maraetai. The camp provided peace and rest for staffers.

On the island of Efate, malaria was also a serious problem and would remain so throughout 1943. From the time Base Hospital No. 2 arrived there on 4 May 1942 to 1 Jan 1943, 2,949 patients were admitted to the hospital and the small scattered field dispensaries on the island.⁽¹⁰⁾ Of these 2,038 were original admissions, while 627 were first readmissions and 284 had

been readmitted more than one time.⁽¹¹⁾ Since occupying the island, approximately one out of every four persons attached to the U.S. forces had acquired malaria.⁽¹²⁾

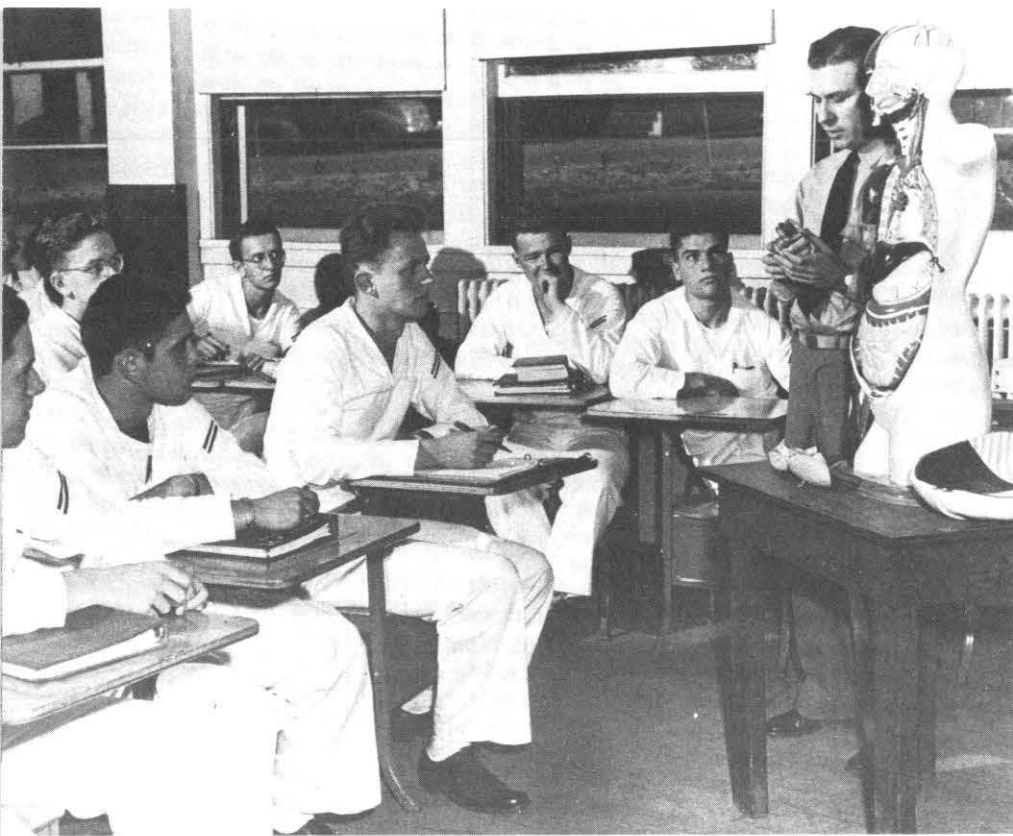
Even with such striking numbers, the death rate from malaria was held to one death. Through continuous suppressive treatment of those in infested areas and periodic Atabrine therapy to those who had been discharged from the hospital, the number of relapses or reinfections were kept at a "moderate figure." Moreover, there were only 2 cases of cerebral malaria and 1 blackwater fever case, all of which responded "to vigorous therapy."⁽¹³⁾

At Mob-5, New Caledonia there was an increasing number of gunshot and mine wounds as well as neuropsychiatric cases. "We had a significant number. We had two or three buildings with NP [neuropsychiatric] or

Photos from BUMED Archives



Immunization was continued aboard an LST in convoy en route to North Africa. The Navy training program had placed the sailors aboard the ship before immunization was completed.



HMC M.M. Long lectures on the functions of the heart at the Navy's Basic Hospital Corps School, U.S. Naval Training Center, Bainbridge, MD.

psychiatric difficulties," recalled former Pharmacist's Mate Daniel A. Brandon.⁽¹⁴⁾

At most overseas Navy hospitals Navy medical personnel assumed several responsibilities. For example, corpsmen at Mob-5 served as anesthesiologists administering spinals, pentothal, and ether. "We trained using surgical packs. Using the spinal needles, you could go through the packs and feel yourself going through the various tissues until you were in the spinal cord,"⁽¹⁵⁾ said Brandon. In addition, corpsmen scrubbed for surgery, held retractors, and sutured.

To help alleviate overcrowding in the New Hebrides medical facilities, Cub One was commissioned Base Hospital No. 3 Espiritu Santo, New Hebrides, on 26 Jan. Cub One had landed on Espiritu Santo, New Hebrides, on 11 Aug 1942.

Hospital Ships on the Move

Like island hospitals and other medical facilities, USS *Solace* was busy shuttling between New Zealand, Australia, New Caledonia, Espiritu Santo, and the Fiji Islands, caring for fleet casualties and servicemen wounded in island campaigns. Personnel aboard *Solace* attempted to treat patients and

return them to duty within a short time. If not possible, patients were evacuated to hospitals for prolonged care.

USS *Relief* was on its way to help with the Pacific island situation. Departing Casco Bay, ME, 8 Feb, *Relief* put into a Boston yard to prepare for Pacific duty. By 23 Feb, she was on her way to the South Pacific Advanced Fleet Base at Noumea, New Caledonia, via the Panama Canal. Up until then, she had been providing health care for men training to man new Navy fighting ships since April 1942.

The Prison Camps

"Hunger, such as Americans in the homeland have never experienced, was always present in Bilibid, and every camp and working detail throughout the Philippines. No person ever had enough to eat,"⁽¹⁶⁾ wrote CAPT L.B. Sartin, MC, commanding officer of the Bilibid Prison Naval Hospital about the worsening conditions.

The lack of food and diseases associated with malnutrition became an increasing problem in POW camps both in the Pacific as well as in Japan. In the Karenko camp in Japan rice and soup were the main fare. Occasionally

there was fruit and on work days the captors allotted the prisoners one extra ounce of rice. Those at Karenko had to pay for their food like at other camps, but weren't allowed to buy any extra except for one pound of sugar per month and vitamin B tablets.

In the POW camps in the Pacific many suffered from beriberi and xerophthalmia. In addition, many developed amblyopia, or lazy eye. In January, about 20 patients with xerophthalmia were transferred from Cabanatuan, located about 60 miles north of Manila, to Bilibid for treatment.

"The painful feet and legs of dry beriberi (Somaliland Foot) torments many of our patients now, denying them sleep or rest or any moment of real comfort. Even morphine fails to serve adequately for relief," wrote CDR T.H. Hayes, MC, in his journal while interned at Bilibid.⁽¹⁷⁾ "We have tried everything. Sedatives, vasodilation, heat, cold, etc. In a series in which we have given spinal anesthesia, temporary relief is obtained in some and made worse in others," he continued.⁽¹⁸⁾

Dr. Hayes added that for some of the patients temporary relief came and then their conditions worsened. Giving them vitamins without a full balanced meal or ration did not subdue the condition. Similarly, the majority of those admitted to the hospital from work details suffered from malnutrition and vitamin deficiency diseases. Deficiency cases accounted for 60 percent of admissions at the Bilibid hospital for January, a 6 percent increase over December. In February, deficiency cases declined about 5 percent, however, due to some improvement in conditions.

One such improvement allowed by the Japanese was permitting internees to establish a fund with which to purchase additional food or other sup-

Patients view training and general information films while convalescing at USNH St. Albans, NY.

plies. Officers could keep 25 pesos per month for pocket money and enlisted men 8 to 10 pesos per month.* Internees used the fund, which totaled about 2,300-2,500 pesos per month, to buy beans, meat, eggs, and fruit to supplement general mess which serviced between 1,500 to 2,000 prisoners.

The Japanese military police came to inspect Bilibid in January. When word came about the inspection, the Japanese distributed goods long overdue. On one given day a truck delivered a 48 cubic foot packing case which had been opened previously. It remained about three quarters full of assorted broken boxes of American Red Cross goods. The Japanese instructed personnel to distribute them to the inmates. In addition, British Red Cross boxes filled with tea, jam, and cheese arrived later.

There were also physical improvements to the Bilibid facilities. A wooden operating room was built in one end of the hospital's surgical ward, and a new ward was established to study and research food deficiency cases. In February, a tailor and cobbler shop were set up with Pharmacist Jeremiah Crews, designated as officer in charge.

There were also several activities under way to stem prison boredom. On 1 Feb, the Japanese started a class in Japanese in the main building of the outer compound with a Japanese interpreter in charge. Two weeks later, classes in English, math, chemistry, astronomy, and engineering began under the supervision of one of the chaplains. Periodically, the captors showed movies, some of which were Japanese propaganda; others were U.S. motion pictures such as "Go West" and "Room Service." It should be noted that the improvements in the



Bilibid camp were thin attempts by the Japanese to show the world they were "humane."

The Training Imperative

As the war raged on, training became increasingly important to the Navy. In January it established an Amphibious Training Center at Milne Bay, New Guinea. The primary purpose of the center was to teach amphibious assault methods. Medical officers were instructed in the care and evacuation of casualties and were briefed regarding reports and returns, sanitation of ships, and prevention of disease prevalent in the area.

Navy medicine also provided health care in training site areas commissioning hospitals in close proximity. U.S. Naval Hospitals Farragut, ID, Bainbridge, MD, and Sampson, NY, commissioned 15 Jan, 4 Feb, 27 Feb, respectively, all supported naval training centers. In addition to providing medical care, USNH Bainbridge and USNH Farragut were medical training sites as well, having Hospital Corps schools attached to them.

In addition, a hospital was commissioned at St. Albans, NY, and another established at Memphis, TN. Moreover, some hospitals like USNH Asheville, NC, were receiving patients prior to their commissioning.

National Quinine Pool

When Java fell to the Japanese, they captured a major portion of the world's supply of cinchona which the United States needed to maintain its stock of quinine, a natural antimalarial agent. Thus, on 11 Jan, on the recommendation of the chairman of the War Production Board, the Secretary of Commerce appointed the American Pharmaceutical Association (APA) to receive, store, and distribute all stocks of quinine for the Armed Forces. To meet this objective, the APA organized a National Quinine Pool which was based at the organization's headquarters in Washington, DC.

The nationwide drive for quinine began in mid-January prior to the pool's official opening which was set for 1 Feb 1943. Among those making appeals were Surgeon General of the Navy, RADM Ross T. McIntire, and BG Larry B. McAfee, Acting Surgeon General of the Army. They both called for pharmacists throughout the country to donate their available stocks of quinine for the war effort.

Donations came from everywhere—Peru, Ecuador, pharmaceutical houses in France, Switzerland, and some bearing labels from Germany and even Japan. A few months later President Roosevelt donated contain-

*The Japanese printed money to pay the internees.

ers of quinine sulfate which the President of Peru sent to him as a personal gift for his own private use.

About 20 personnel—Navy, Army, and civilian—worked at the pool for months at a time. Six pharmacist's mates, four of whom were registered pharmacists from the Navy Dispensary Washington and BUMED, were the first of the service personnel to report to the pool. They were assigned early in February. At one point, the Army also assigned six pharmacists from Walter Reed Hospital. They remained on duty about 2 months, "until the receipts peak was reached and the tremendous piles of stored packages began to melt." (19)

Other Developments

RADM McIntire continued to make changes at BUMED. In February, the Surgeon General called for a reorganization of BUMED's Dental Division. He charged the Dental Division with being knowledgeable of professional dental practice standards for the Medical Department, conducting surveys and inspections to maintain standards, and advising BUMED on expansion of dental facilities, personnel, dental equipment and supplies, and special authorizations for dental treatment. To carry out these functions, the Dental Division was divided into two sections—standards and inspection.

On 3 Feb, personnel management at BUMED was reorganized to combine all divisions—Medical Corps, Dental Corps, Nurse Corps, Hospital Corps, WAVES, and Civilian (Bureau and Field)—under one division. In addition, a weekly newsletter was inaugurated, the forerunner of *Navy Medicine*.

Worth Mentioning a Second Time

In battle there are many stories of bravery and heroism and the new year brought no exception. One memorable story was that of PHM1c Howard Augustus Schrum, a pharmacist's mate aboard submarine chaser USS PC577 employed to pick up survivors

from torpedoed vessels in the South Atlantic. PHM1c Schrum examined and administered first aid to approximately 152 survivors brought on board. While doing so, he removed 2 bone splinters from a fractured skull, administered 11 sutures, set 3 broken legs and 2 broken arches, and treated 3 third-degree burns as well as numerous first- and second-degree burns. Only one death occurred as a result of third-degree burns. Later, Army medical authorities reviewed his work and pronounced the treatments excellent.

"... Considering the facilities he had to work with and the manner in which the ship rolled, he did an outstanding job... The Army medical authorities at Paramaribo were amazed at the thoroughness of PHM1c Schrum's work. X-ray pictures showed that even the fractured skull had been perfectly treated..." noted D.M. Kerr, commanding officer. (20)

PHM1c Schrum went above and beyond what is normally expected of a first class pharmacist's mate. His exceptional skill mirrors that of the Navy Medical Department. He received a citation and Legion of Merit for his exceptional performance.

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